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Outlook and Situation Report

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Long-term grain agreements, pages 11 and 12.



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Summary

The second long-term grain agreement between the United States and the Soviet Union, signed on August 25, 1983, will be in effect until September 30, 1988. Under the new agreement, which requires the Soviets to purchase 9 million tons of U. S. wheat and corn each year (or 8 million if they buy 500,000 tons of soybeans or soybean meal), the United States is guaranteed an important share of the Soviet grain import market.

In 1983, the value of Soviet domestic agricultural production surpassed the 1978 record. High livestock output and better results for most crops brought the total value to nearly 134 billion rubles (1973 prices are the usual Soviet measure for this indicator). The 5-percent increase was smaller than some components would have suggested, and probably reflected continuing difficulties in expanding grain production.

USDA estimates total Soviet agricultural imports declined from \$21 billion in 1981 to about \$19 billion in 1982, to about \$18 billion in 1983. The decline reflects lower grain, and in 1983 lower sugar, imports. Grain imports dropped in 1983 to about 34 million tons, of which the United States supplied almost 8 million.

USDA estimates 1983 Soviet grain production at 195 million tons, their sixth biggest crop. Coarse grain production, at an estimated 105 million tons, resulted from record area and the fourth highest yield. Coarse grain area was up, not only because of weather that caused reseeding of winter wheat area, but also because of an apparent Soviet policy that encourages coarse grain production. Wheat production is estimated at 78 million tons, the lowest since 1975. The increase in coarse grains and the still-substantial imports allowed the Soviets to feed near-record amounts of grain. The 1983 forage harvest also reached a record, which allowed the USSR to reduce the share of grain in animal rations.

Among other crops, sugarbeet output was 82 million tons, the highest since 1978. The potato crop, regarded in the USSR as the "second bread," reached 83 million tons, enough for food use and for further supplementing feed supplies. Fruit production may have been a record, and vegetables, at 29 million tons, were a near record. Although raw cotton production was down very slightly, increased hand-harvesting probably improved quality substantially. The Soviets indicated the sunflower production figure was near 1982's.

The livestock sector did particularly well. Meat, milk, and egg production reached records. Meat reached 16 million tons, up 4 percent from 1982. Milk reached 96.4 million tons, and eggs reached nearly 75 billion units. Animal inventories on January 1, 1984, included 119.4 million head of cattle; 78.5 million hogs; and 151.4 million sheep and goats. This kind of overall record performance probably resulted from a combination of two generally mild winters, better feed supplies, and increases in State procurement prices for livestock products on January 1, 1983.

To the extent the Food Program recognizes problems facing Soviet agriculture, these factors suggest the Soviets will maintain modest overall agricultural improvements throughout the 1980's, despite inevitable year-to-year fluctuations in production. The 1984 outlook suggests a second year of impressive livestock performance. The condition of the winter grain crop as of mid-April, suggests a crop approaching the long-term trend projections. However, moisture deficiencies in some key grain areas threaten yield prospects.

WEATHER HIGHLIGHTS FOR 1983

Although it is difficult to generalize about an agricultural area as vast as the USSR, it appears that weather was better for Soviet agricultural production in 1983 than in 1982. The north and central European area, important for barley, rye, and flax, had adequate soil moisture for fall-sown crops. The area also had one of the mildest winters on record, followed by an early, and not excessively moist, spring. Summer weather was cooler than normal with good precipitation during the growing season, and fairly dry conditions held through the harvest.

In parts of the southern European USSR, weather was less favorable. In general, this area is most important for winter wheat and for spring-sown crops such as sunflowers, sugarbeets, and corn. Very dry soil in the southern Ukraine, North Caucasus, and Lower Volga Valley delayed planting of winter crops in the fall of 1982 and also resulted in poor seed germination and plant development. The south was devoid of persistent snowcover, which increased the potential for winterkill, but snowfalls generally preceded drastic drops in temperature. The early arrival of spring weather was helpful, but hot weather from mid-May into early June in the southeast stressed winter wheat in the heading stage. An unusual cold snap in late June, followed by unseasonably hot, dry weather through mid-July in the eastern Ukraine, southern Black Soil Zone, and North Caucasus, reduced potential barley and corn yields. While overall conditions for winter grains may have been better than in 1982, the Communist Party Chief for the Ukraine reported that in the "southern and southeastern oblasts, where the basic grain crop areas are concentrated" conditions were "highly unfavorable" (*Pravda*, October 22, 1983).

Spring sowing proceeded generally on schedule in most of Kazakhstan; however, in western Siberia, cold and wet weather in the second half of May and early June caused delays. Throughout the summer, periods of hot weather and dry winds seriously stressed the crops, particularly in the east-central New Lands. On August 25, *Izvestiya* reported that "the fields of North Kazakhstan and many regions of Siberia have been scorched by dry, hot winds." However, the impact of the winds on the grain crop was not believed to be as serious as in 1982.

Surface irrigation supplies for Soviet Central Asia were limited by lower-than-normal snowfall in the Tyan' Shan' and Pamir Mountains. While the area is most noted for cotton, it is also an important fruit and vegetable area. Here, however, rainfall was above normal during early summer, and in June, a period of cooler weather decreased water needs. The cooler weather slowed crop development, and in July, unusually hot weather hurt cotton yields. However, rains and snow generally held off, permitting an extended harvesting season that ran through December.

GRAIN PRODUCTION INCREASES

The Soviet Union is the world's third largest grain producer. USDA estimates the 1983 crop at 195 million tons, about 8 percent above the estimated 1982 crop (table 1). The Soviet press (*Ekonomika sel'skogo khozyaistva*, *Agricultural Economics*, no. 1, 1983) reported

that targeted production was 238 million tons on an area of 124 million hectares with a yield of 1.92 tons per hectare. The USSR has never reached such ambitious yields for grain production. This, coupled with a willingness to undertake long-term import commitments totaling 20 million tons a year, suggests that Soviet planners no longer believe they can obtain the published targets for 1981-85.

Changes in Production Strategy

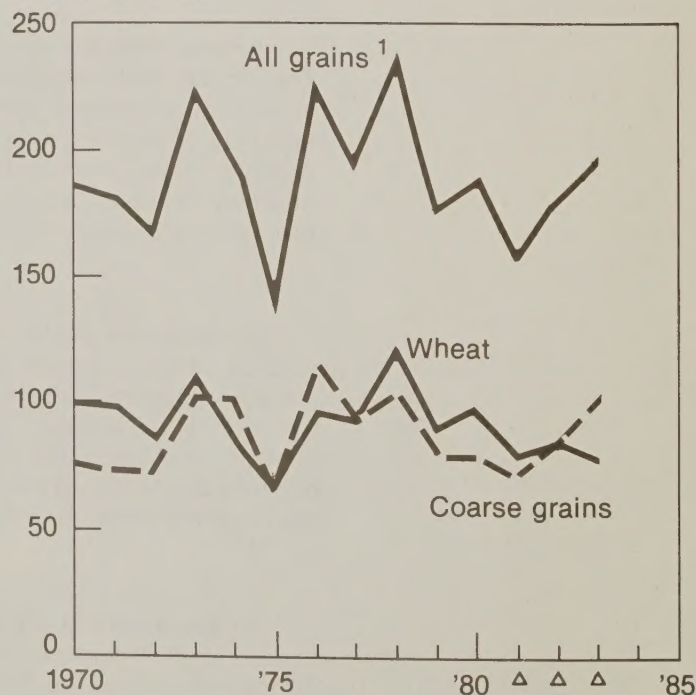
In 1983, grain area declined 1.5 million hectares to an estimated 121.5 million hectares. This drop continues the downward trend in grain area from 1977's 130.3 million hectares. The primary reason has been the goal of increasing the share of clean summer fallow in crop rotations. In the last 8 years, the area devoted to clean summer fallow has increased 7 million hectares, with nearly 2 million in 1983 alone, and has reached an estimated total of 19 million hectares.

Despite the decline in total grain area, coarse grains covered a record 62 million hectares, and pulse area increased 30 percent to 6.2 million hectares (*Vestnik statistiki*, *Statistical Bulletin*, no. 10, 1983). Wheat area, on the other hand, fell to its lowest level since 1954, less than 51 million hectares (table 1).

Weather played a role in the area shift among grains. Dry conditions in the North Caucasus, and eastern and southern Ukraine, forced below-plan sowing of winter wheat in the fall of 1982 (only 32.5 million hectares out of a planned winter grain area of 36 million were sown with the shortfall almost entirely winter wheat). Furthermore, large areas of winter wheat had to be reseeded to spring barley and corn. Preliminary Soviet area data

USSR Grain Production

Mil. metric tons



△ Estimates ¹Includes rice, pulses, etc.

confirmed that winterkill, along with diversion of winter area to grazing and green chop, amounted to 12 percent. Since 1979, these losses have averaged about 13 percent of the seeded area; between 1974 and 1978, they averaged about 17.5 percent.

Possibly more important than weather in explaining the shift in area was the policy decision to emphasize coarse grains and pulses, primarily at the expense of spring wheat.¹ For example, procurement prices for barley and oats were increased on January 1, 1983, between 18 and 39 percent in major growing areas, and for corn, prices were increased a third nationwide. Wheat prices (excluding durum), on the other hand, were increased a mere 5 percent in the Russian Republic (RSFSR) and the Ukraine, and only 12 percent in Kazakhstan.² Soviet agricultural specialists generally consider barley a more valuable feed than wheat, because of a higher content of the protein-building amino-acid lysine. By replacing wheat with barley, the Soviets plan to reduce the serious shortage of lysine in their feeds.³ Pulses have been emphasized over wheat for their higher overall protein content, and corn for its higher energy value, particularly for poultry. There has also been a shift from winter wheat to more winter-hardy rye in the last 2 years in the Non-Black Soil Zone with the introduction of new higher yielding varieties.⁴ An advantage of rye is that it can be used for breadmaking, while winter wheat grown in this same region is of such low quality it generally cannot. Another reason for the shift to coarse grains might be the Soviet Union's desire to shift its major import requirements to wheat, for which more large suppliers are available.

In 1983, an early spring in the European USSR resulted in an earlier-than-normal harvest. As of August 29, 1983, grain had been cut on 86.3 million hectares as compared to 81.1 million hectares a year earlier. As the harvest moved into the New Lands, however, the pace slowed and *Sel'skaya zhizn'* (*Rural Life*) on September 15, 1983, reported, "farmers in the eastern regions, where harvesting has entered its decisive stage, are having a difficult time this year. Time and again rain has held back the harvesting." These delays led to quality problems and may have been responsible for the shortage of high-quality seeds in Siberia for spring sowing in 1984.

The increased coarse grain area and probably the fourth highest yields on record (estimated at 1.68 tons per hectare) resulted in production of 105 million tons, 19 million tons above the 1982 estimate. Wheat production fell to 78 million tons (yields estimated at 1.55 tons per hectare), down 9 percent. The high yields may have been the result of a 14-percent increase in fertilizer deliveries, for which grains and feed crops had high priorities.⁵

The quality of wheat in terms of protein and gluten content has declined noticeably in recent years.⁶ In 1983, problems procuring sufficient quantities of quality wheat continued.⁷ Kazakhstan provided relatively high-quality wheat to the State, but serious shortfalls from planned deliveries of quality wheat were noted in Siberia and the Volga Valley.

Grain Availabilities Increase

The estimated grain harvest of 195 million tons, combined with 1983/84 July-June imports of 31 million tons,

Interpreting Chernenko's Grain Production Remarks

The last two times very high Soviet officials publicly announced a specific grain production number were in 1979 and 1980.

On November 27, 1979, General Secretary Brezhnev announced that 1979 production was "179 million tons." The number subsequently published was 179 million tons. On October 21, 1980, N. Baibakov, a Deputy Chairman of the Council of Ministers and Chairman of the State Planning Committee, issued a budget report that permitted one to infer a grain production number of 181 million tons. The number subsequently published was 189 million tons.

At the same plenum containing Baibakov's speech, Brezhnev reported that for the first time in the USSR, the "average annual grain harvest surpassed 200 million tons" for the tenth 5-year plan period. The number published was 205 million tons.

In 1981, the Soviets abandoned officially reporting a grain production number. In the plan fulfillment report for that year, they adopted the formulation that "State grain resources fully ensure that the country's population is provided with bread and bread products." This language became a standard feature of plan fulfillment reports covering 1982 and 1983 as well.

In 1983, however, probably to increase credibility for the Food Program, very high officials publicly made pronouncements on grain production. For example, L.A. Kostandov, a Deputy Chairman of the Council of Ministers, in a news conference, put 1983 production at the third best in 8 years, or between 195 and 224 million tons (*USA Today*, December 27, 1983). On March 2, 1984, General Secretary Chernenko in a "campaign" speech for the Supreme Soviet said, "Quite a lot was done to develop agriculture...this produces tangible results. Judge for yourselves. We were unlucky with the weather last year as well, but the grain crop exceeded 190 million tons."

Chernenko's obvious comparisons for grain production would be to the last published data easily in the public domain. The most obvious would be against the annual average for the tenth 5-year plan, or 205 million tons. Presumably, a crop higher than 205 million tons would immediately be compared to that benchmark. If the crop did not compare favorably to 205 million tons, the last published number, 189 million tons, would invite comparison. Thus, Chernenko's "exceeded 190" comment can show forward progress, confirming an improvement over 1980, while avoiding disappointing comparisons with either 1976-80 performance or 1981-85 plans.

On March 12, 1984, USDA lowered its 1983 USSR grain crop estimate from 200 million tons to 195 million tons.

has facilitated both larger grain use and some rebuilding of stocks during the 1983/84 July-June year (table 2).⁸ Continued large imports of wheat, 20 million tons in 1983/84, helped to improve domestic milling supplies and

allow an estimated 3-million-ton increase in stocks, which have been drawn down in recent years. With coarse grain production near its second highest, coarse grain imports in 1983/84 were allowed to fall to 10 million tons, roughly the minimum called for in the various long-term trade agreements. Resulting availabilities were sufficient to guarantee record coarse grain feeding. Total estimated grain fed in 1983/84 of 123 million tons nearly matched the 125-million-ton record in 1978/79, following 4 years of relatively tight grain for feed supplies.

A Better Start in 1984

Total grain area in 1984 will likely be close to last year's, given the gradual increases in arable land, little or no decline in area requirements for other crops, and clean summer fallow progression towards long-term Soviet guidelines of 20-22 million hectares. Winter grain area, however, is likely to be higher than 1983. Winter crop sowing was carried out on 40 million hectares, implying an increase in sowings of winter grain. Soil moisture for winter grain sowing was better than last year. As of early April, there was little indication of excessive winter-kill. Supplies of high-quality seeds for spring grain sowing may be better in most areas except Siberia (*Sel'skaya zhizn'*, February 1, 1984). Spring grain area may decline this year. Though corn and pulse area may show modest expansion in 1984, spring barley area is likely to decline, and spring wheat area is expected to be close to last year's. As of early April, soil moisture deficiencies were threatening grain yield prospects in the North Caucasus, Central Black Soil Zone, Volga Valley, and eastern Ukraine. [Edward Cook (202) 475-4508]

RECORD FEED SUPPLIES ENTERING 1984

The turnaround in the Soviet feed situation in the last 2 years has been particularly striking, with availabilities now well above the previous record of 1978/79. With the Soviet oat-unit equivalent measure, feed supplies in the

July-June 1983/84 year are estimated to be more than 4 percent larger than last year and nearly 9 percent larger than the average for the last 4 years. Supplies of coarse and succulent feeds have increased most dramatically. Final production in 1983 of hay was 29 percent above the 1979-82 average, while that of silage was 15 percent higher and that of haylage 11 percent higher. Furthermore, there is evidence that the quality of hay, haylage, and silage has improved in recent years.⁹ The improved production of feed crops in 1983 was evident from early October reports. However, the gap between silage production in 1983 and the average for 1979-82 narrowed by November, the end of the harvesting season.

Soviets Conserve Grain Used for Feed

Record livestock production in 1983 was achieved while feed use of grain was kept below the previous record. In fact, grain's share of the total feed supply, in oat-unit equivalent, has declined from a high of 37.6 percent in 1979/80 to 34 percent in the last 2 years. This reverses the longer trend toward increasing grain's share in the total feed supply exhibited since the mid-60's when grain accounted for only 25 percent of Soviet feeds.

The Soviets are pursuing a number of policies to increase not only the quantity of nonconcentrate feeds, but also the quality, and to reduce their costs of production. From the farm management's point of view, it has been reasonable to rely on feed grain rather than nonconcentrate feeds. The high nutrient losses in harvesting, storing, and handling nonconcentrate feeds have made them more expensive than grain on an energy-unit basis.¹⁰ Between 1965 and 1977, the amount of concentrates fed to produce either a liter of milk or kilogram of beef doubled.¹¹ Though this partially reflects the shift to industrial-type feeding facilities, Soviet agricultural specialists have seriously questioned the lack of attention given to producing and feeding quality bulk fodder to cattle.¹² The Soviets are now hoping to reduce the share of concentrates in cattle rations.¹³

Soviet feed supplies by type in oat-unit equivalent, January 1 standard animal units, and feed per standard animal unit

| Units | 1976/77 | 1977/78 | 1978/79 | 1979/80 | 1980/81 | 1981/82 | 1982/83 ¹ | 1983/84 ¹ |
|---|---------|---------|---------|---------|---------|---------|----------------------|----------------------|
| <i>Million tons</i> | | | | | | | | |
| Total feed | 395.7 | 401.4 | 416.6 | 393.0 | 400.3 | 384.3 | 413.8 | 431.4 |
| Coarse ² | 78.1 | 78.7 | 87.8 | 76.4 | 82.4 | 80.7 | 86.3 | 93.3 |
| Pasture | 64.6 | 64.6 | 64.5 | 61.7 | 61.2 | 61.4 | 62.6 | 63.0 |
| Succulents ³ | 95.1 | 86.9 | 88.8 | 81.9 | 84.1 | 76.5 | 96.4 | 98.9 |
| Concentrates ⁴ | 157.9 | 171.2 | 175.5 | 173.0 | 172.6 | 165.7 | 168.5 | 176.2 |
| <i>Million units</i> | | | | | | | | |
| January 1 total animal units ⁵ | 138.4 | 143.9 | 147.0 | 148.7 | 149.4 | 150.8 | 153.4 | 156.0 |
| <i>Tons</i> | | | | | | | | |
| Feed per standard animal unit | 2.86 | 2.79 | 2.83 | 2.64 | 2.68 | 2.55 | 2.70 | 2.77 |

¹Preliminary. ²Includes hay, haylage, and straw. ³Includes silage, green chop, potatoes, feed roots, melons, and beet pulp. ⁴Includes grain, millfeeds, oilmeal, fish and animal meal, grass meal, feed yeasts, and whole and skim milk. ⁵In terms of cows, conversion ratios as follows: cattle (other than cows) 0.6, hogs 0.3, total sheep and goats 0.1, horses 1.0, poultry .02.

**Selected feed output from all sources, by type,
late September-early October**

| Year | Hay | Haylage | Straw | Silage | Feed roots |
|----------------------------|------|---------|-------|--------|------------|
| <i>Million metric tons</i> | | | | | |
| 1975 | 46.5 | 47.0 | 79.8 | 144.3 | 33.2 |
| 1976 | 49.7 | 62.1 | 97.2 | 211.7 | 49.9 |
| 1977 | 45.0 | 65.8 | 76.3 | 197.8 | 45.3 |
| 1978 | 52.8 | 71.0 | 86.4 | 163.6 | 45.7 |
| 1979 | 52.6 | 54.4 | 68.3 | 163.2 | 38.4 |
| 1980 | 54.3 | 67.7 | 78.5 | 170.5 | 41.6 |
| 1981 | 64.1 | 55.1 | 79.0 | 162.7 | NA |
| 1982 | 61.8 | 60.9 | 85.9 | 195.8 | NA |
| 1983 | 74.9 | 66.6 | NA | 210.8 | NA |

NA = Not available.

Under the Food Program, investment priority within the feed-livestock sector has been shifted from constructing livestock complexes to guaranteeing adequate feed supplies.¹⁴ Feed supplies are viewed as the primary constraint to further livestock production growth. Sown area is being shifted to higher yielding perennial grasses at the expense of annual grasses, and greater area is being devoted to leguminous crops because of their higher protein content. The Soviets are continuing to increase on-farm processing of bulk feed to reduce nutrient losses, and have expanded production of grain substitutes such as dehydrated alfalfa meal and low-cellulose silage.

The effort to expand the area of high-protein crops such as alfalfa, rapeseed, soybeans, and pulses is part of a larger policy of increasing protein supplies in livestock rations. As a reflection of this policy, imports of soybean meal have increased dramatically since 1979. This has allowed production of mixed feeds to continue expanding. Although the last published data were for 1980, available information indicates mixed feed production likely increased 10 percent or more between 1980 and 1983, and now exceeds 70 million tons a year.¹⁵

The Soviets are extending the brigade system to feed crop lands in the hope of establishing more stable production conditions. Under this system, labor brigades are assigned input and production targets and are responsible strictly for feed crop production for no less than a 1-year period. In 1983, the brigade system was greatly expanded and covered nearly 25 percent of all feed crop land.¹⁶

Efficiency Will Remain a Problem

Despite increased feed production in the last 2 years and some indication of higher feed quality, problems continue to limit progress in upgrading feeds and improving feeding efficiency. Shortages have been noted in machinery for chemically treating feeds and plastic covers for bunker silage. Tower silos constructed in the last 10 years to store haylage are largely empty because of inappropriate loading and unloading machinery. Despite high imports of soybeans and soybean meal, the overall protein imbalance in Soviet feed rations remains large, equal to roughly 11-14 million tons of soybean meal.

Recently published figures on feed-conversion ratios for beef, pork, and milk production on State and collective farms indicate no improvement in Soviet feed conversion efficiency. The comparable U.S. ratios are some 40 percent lower. [Edward Cook (202) 475-4508]

**USSR feed-conversion coefficients (kilogram of
oat-unit equivalent/kilogram of output)**

| Product | 1971 | 1980 | 1982 |
|---------|------|------|------|
| Beef | 10.3 | 13.4 | 13.4 |
| Pork | 9.2 | 9.2 | 9.2 |
| Milk | 1.4 | 1.5 | 1.6 |

Sources: *Ekonomika sel'skogo khozyaistva*, no. 5 (1972); *Vestnik statistiki*, no. 10 (1981), and no. 11 (1983).

LIVESTOCK SECTOR MAKES RECORD GAINS

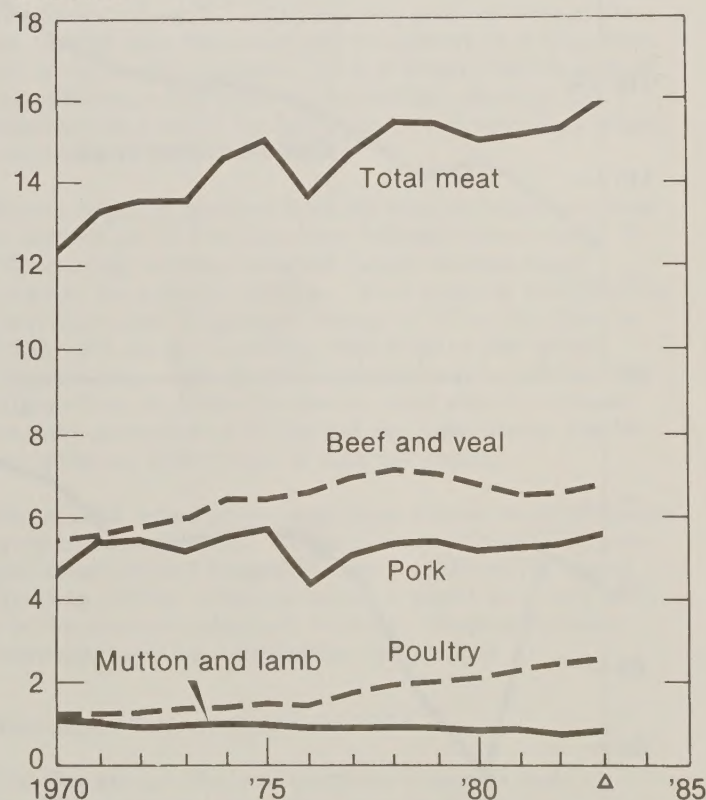
A mild 1982/83 winter and ample livestock feed supplies in 1983 contributed greatly to the gains made in the livestock sector. Livestock productivity was up for cattle, cows, hogs, and poultry. Meat and milk production reached a record, as did egg output. Speaking at a high-level conference on the agro-industrial complex (APK), Mikhail Gorbachev reported that all Soviet republics met procurement plans for the most important livestock products "for the first time in 9 years."

Livestock Inventories and Weights

Cattle inventories (including cows) on January 1, 1984, totaled 119.4 million head, up 2 percent from a year ago for the largest percentage increase in 6 years (table 3). The hog population rose 2 percent to a record 78.5 million head, but at a slower rate than in 1982. Poultry inventories likely set a record of around 1.13 billion.

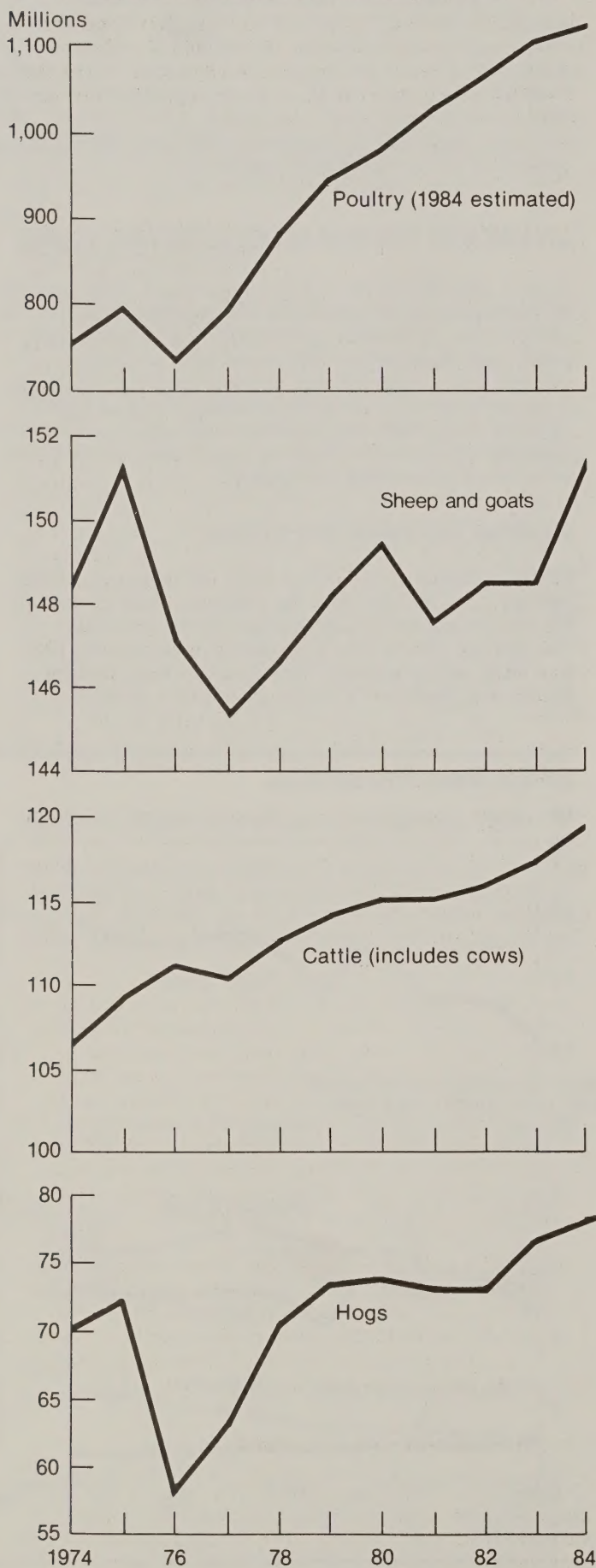
USSR Meat Production

Mil. tons



Δ Estimates.

USSR Livestock Inventories, January 1, 1974-1984



After several years of stable inventories, sheep and goat numbers gained considerably and rose to a record 151.4 million. Better grazing conditions than last year in the important sheep and goat raising areas of Kazakhstan and Soviet Central Asia contributed to the growth. Monthly holdings on State and collective farms (table 4) followed usual seasonal trends.

After falling in 1982, average slaughter weights of cattle and hogs on all farms in 1983 rose 3 percent, to 349 kilograms, and 4 percent, to 105 kilograms, respectively. Although the entire 1983 cattle and hog marketings are not available, published January-September 1983 marketings on State and collective farms showed that larger numbers of cattle and hogs at much higher weights were sent to slaughter than a year earlier. Marketings of slaughter cattle and hogs rose 1 percent and 6 percent, respectively, from the same period in 1982.

Successes in Meat and Dairy Production

Total meat production (carcass-weight) in 1983, reported at a record 16 million tons, was up 4 percent from 1982 and 3 percent from the previous record set in 1978 (table 5). The total was less than had been anticipated, based on monthly reports of both farm and industrial meat production; however, the Soviets twice revised 1982 data upward, and it may be that the 1983 figure will also be increased. The largest gains were probably in poultry meat and pork, both of which set records. Poultry meat rose an estimated 7 percent; pork an estimated 5 percent; beef and veal an estimated 3 percent; and mutton and lamb an estimated 4 percent.

Government purchases of meat from all farms in 1983 totaled 17.5 million tons, liveweight (about 10.9 million tons, carcass-weight). The 9-percent rise in liveweight meat purchases was helped by increased meat sales not only from the collective and State farms, but also from a rebound in sales from the private sector. With the increase in Government supplies of meat for processing, the food industry output of meat rose to a record 10.2 million tons, up 10 percent from 1982. Sausage production reached 3.2 million tons, an increase of 4 percent. With the good showing in domestic meat production combined with record imports, per capita meat consumption in 1983 probably rose 2 kilograms to a record 59 kilograms, but still 25 percent below the Soviets' recommended nutritional norm (table 6).

Following 4 years of declining milk production, output recovered in 1982, and in 1983 increased to a record 96.4 million tons, up 6 percent from 1982. Strong gains were made in milk yields per cow, especially on socialized farms. During January-November 1983, average milk yields on these farms rose 7 percent over the same period in 1982, the first relatively good gain since at least 1978.

Government milk purchases from all farms reached a record 63.4 million tons, up 9 percent from a year ago. The large gain in purchases from State and collective farms, which sell about 98 percent of their production to the State, offset the reduced purchases from the private sector. Reduced private sector sales probably reflect the declining milk output in this sector since 1979. With the considerable increase in the Government's supply of milk for processing, the food industry output of whole milk products and butter reached records, as probably did cheese. Whole milk products, at 27.8 million tons, rose 5

percent; butter, at 1.5 million tons, rose 13 percent; and cheese, estimated at around 740,000 tons, rose 6 percent. Per capita consumption of milk and milk products (including the fresh milk equivalent of butter, cheese, cream, etc.) improved considerably in 1983 because of much larger domestic supplies. It is estimated that consumption rose to 302 kilograms, up 7 kilograms from 1982's reduced level of 295 kilograms, but as with meat, still 25 percent below the Soviets' recommended norms.

Egg output rose to a record of 74.7 billion, up 3 percent from the previous record in 1982. Egg yields per hen in the socialized sector during January-November in 1983 rose 5 percent over the same period in 1982. Per capita consumption in 1983 probably rose 5 eggs from 1982's 249 eggs.

Wool production in 1983 totaled 454,000 tons (physical-weight basis), up only 2,000 tons from 1982. On a greasy basis, output probably reached 473,000 tons, versus 471,000 tons in 1982.

Stage Set for Further Achievements

The broad-fronted improvement in the meat and dairy sector suggests several factors were at work during 1983, some of which can be assumed to have longer impacts. Most important was probably the increased feed availability in 1983, coupled with a mild 1982/83 winter and the early spring. The large animal numbers on January 1, 1984, suggest these benefits will carry forward.

Institutionally, the Soviets increased State procurement prices 34 percent on January 1, 1983, for meat (live-weight) purchased from farms, and increased prices 25 percent for milk purchased from farms. These increases were part of a general price improvement package, which in total, was almost as large as previous increases covering the entire 17 years of the Brezhnev era. Some 70 percent of additional funds set aside to finance the price increases was channelled to stimulate stockraising activities, according to the Chairman of the USSR State Committee for Prices (*Voprosy ekonomiki, Problems of Economics*, January 1984). To retain skilled workers in stockraising, a wage incentive, keyed to length of service, went into effect in several regions of the USSR (*Pravda*, February 10, 1983). In addition, some 53,000 collective contract teams—which the Soviets consider an important reform because team wages are more closely linked to results—were set up in animal husbandry. This would represent a third of all such teams in Soviet agriculture. Each of these factors will probably exert a favorable influence in 1984.

Finally, although the evidence is less direct, the improved performance may also have reflected the increased scrutiny to which the entire meat and dairy sector was subjected in 1983. For example, the USSR poultry-raising industry, which had consistently shown increased output since 1978, was criticized by the national level commission on the APK for its low productivity and "overexpenditure on feed" (*Sel'skaya zhizn'*, December 14, 1983). Certain deputy ministers of the meat and dairy industry were criticized and replaced during the year, and in January 1984, the minister himself was replaced without fanfare, despite the sector's record performance. [Angel Byrne (202) 475-4505]

BETTER SUGARBEET CROP

Sugarbeet output in 1983 reached 82 million tons, the largest output recorded since 1978 (table 7). This year's 14-million-ton shortfall from targeted output marks the seventh consecutive year that Soviet sugarbeet farmers failed to reach their production goal.

Efforts to Improve Yields Succeed

Sugarbeets were sown on about 3.5 million hectares in 1983. Yields are estimated to have reached 23.3 tons per hectare, almost recovering to the 1976-80 average. The sugar content of beets is estimated to have increased from 10.6 percent in 1982 to about 11 percent. Good weather was primarily responsible for the improvements. Other factors included a 40-percent increase in the area under industrial crop technology (ICT), and the provision of higher economic incentives.¹⁷ Procurement prices increased substantially. In the RSFSR, where a quarter of the crop is produced, prices increased 46 percent. In the Ukraine, where about 50 percent of beets are annually produced, prices rose 21 percent—an increase far higher than in the past. In 1976 and 1981, procurement prices increased only about 9 percent. Profits had been declining. For example, in the Ukraine, they dropped 10 percent between 1966 and 1980 because of low rates of return on inputs.¹⁸ A bonus program for high sugar-content beets, which the Government introduced in 1982, was continued, as were economic penalties imposed for farmers supplying low-quality beets. In the past, economic incentives had promoted quantity at the expense of quality. Government procurement of sugar beets reached an estimated 78 million tons (table 8).

Although the Soviets had announced a planned 2,000-ton increase in their 818,000-ton-a-day processing capacity, no reports have been received to indicate that this modest increase was reached. Lack of incentives for promoting efficiency continues to plague the industry. For instance, at several facilities the cost of producing sugar continues to exceed revenues.¹⁹

Soviet sugar production from all sources increased about 2 percent, to 12.4 million tons (refined value) (table 9). The percent increase was not larger because sugar imports (by volume) declined. Beet sugar is estimated to have increased 15 percent, rising to 7.8 million tons in 1983, still about 1.2 million tons short of the target. Because beet sugar production was about a million tons higher than in 1982, the Soviets were able to decrease imports somewhat and still maintain per capita consumption at 1982's level of 44.5 kilograms.

Since 1982, retail prices have been raised twice to reduce government subsidies. Prices increased from 94 kopeks per kilogram to 1.04 rubles, then to 1.07 rubles (about \$1.45 at official exchange rates, or about an hour's work for the average industrial worker). These price hikes were disguised by repackaging the product.

Continued Improvement for 1984

The Soviets are likely to continue to pursue yield improvements resulting from increased area under modern farming techniques. The area under ICT is expected to increase from about 1.7 million hectares to

2.1 million in 1984 (about 60 percent of sown area). Efforts to cut high harvest losses will depend on the Soviets' ability to avert chronic fuel and equipment problems. [Thomas Bickerton (202) 475-4509]

NO IMPROVEMENT FOR OILSEEDS

Soviet oilseed output remained essentially unchanged in 1983, with production estimated at about 11 million tons. Although most other Soviet crops benefited from generally favorable weather in 1983, the major oilseed areas suffered from damaging temperatures and winds. As a result, oil and meal produced from domestic oilseeds will continue to fall short of demand.

Sunflowerseed Production Remains Flat

Although the Soviets have yet to announce actual sunflowerseed output, they have indicated that 1983 sunflowerseed output is close to last year's 5.3-million-ton crop. This is far short of the 6.6-million-ton production target. Throughout the year, the eastern and southern Ukraine, where one-third of the crop is produced, suffered from progressively worsening soil moisture conditions. In addition, the more important of the two regions, the eastern Ukraine, had significant areas of sunflowers flattened by winds in mid-September (*Pravda Ukrainy*, Sept. 14, 1983). Such weather-related losses more than offset expected yield increases from the Soviets' continued expansion of ICT farming, and the increase in procurement prices, a rise that reversed the pattern of declining prices since the mid-1970s.

Cottonseed output, at about 5.0 million tons, the fourth largest, was about 100,000 tons short of last year's crop. Rapeseed area, accorded the most attention in the Soviet press this year among oilseeds, expanded by three-fourths to an estimated 175,000 hectares. Soybean production is estimated at one-half million tons, about the same as last year's poor crop and just 38 percent of targeted output. Soviet efforts to expand sown area failed primarily because of unfavorable weather. By late spring, more than 1 million hectares were reported sown. However, in the Far East, where roughly 70 percent of the crop is located, weather impeded maturation and harvesting. Soybeans located in the western USSR were subjected to the same conditions that damaged the sunflower crop. As a result, final harvested area is estimated at 850,000 hectares.

Processors Lack Domestic Supplies

As in the past, insufficient quantities of domestic oilseeds will be available for processing into meal. In 1983, the Soviets are estimated to have produced about 4.7 to 4.8 million tons of oilseed meal (soybean meal equivalent), less than two-thirds of their total consumption of meal and just a fraction of their actual oilseed meal needs. Because meal produced from domestic sources will decline slightly, any growth will have to be achieved through imports. Domestic crushing of sunflowerseed and soybeans will be at last year's level, and cottonseed crushing should decline about 2 percent.

The Soviets increased vegetable oil production in 1983 about 7 percent to about 2.8 million tons. The increase is attributed to the larger 1982 sunflowerseed crop. In

USSR oilseed production

| Year | Sunflower-seed | Cottonseed | Soybeans | Other ¹ | Total |
|-------------------|----------------|------------|------------------|--------------------|--------|
| 1,000 metric tons | | | | | |
| 1971-75 Average | 5,974 | 4,295 | 471 | 249 | 10,989 |
| 1976 | 5,277 | 4,511 | 480 | 232 | 10,500 |
| 1977 | 5,904 | 4,693 | 540 | 175 | 11,312 |
| 1978 | 5,333 | 4,804 | 634 | 243 | 11,014 |
| 1979 | 5,414 | 4,510 | 467 | 196 | 10,587 |
| 1980 | 4,618 | 5,082 | 525 | 225 | 10,450 |
| 1976-80 Average | 5,310 | 4,720 | 529 | 214 | 10,773 |
| 1981 | 4,678 | 5,279 | ² 450 | 192 | 10,599 |
| 1982 | 5,341 | 5,094 | ² 490 | 308 | 11,233 |
| 1983 ² | 5,300 | 5,000 | 500 | 271 | 11,071 |

¹Does not include oilseeds from fiber flax and hemp. ²Estimate.

recent years, overall vegetable oil yields fell because the share of sunflowerseed in oilseeds crushed declined while the cottonseed share rose. The oil extraction rate for cottonseed is only 13 to 17 percent compared with 46 to 48 percent for sunflowerseed. The estimated 1983 shortfall of cottonseed, coupled with the relative lack of growth of soybeans, will increase Soviet demand for foreign vegetable oil.

Some Improvement Possible

Sunflower area is not likely to increase because the Soviets want to lengthen the crop rotation cycle to reduce the spread of sclerosis and other disease-carrying agents. The Soviet press has criticized farmers who fail to adhere to the recommended 8- to 10-year rotation and who instead use a 3- to 5-year rotation.²⁰ Rotation is an important control method in the USSR because of the shortage of effective pesticides. On average, yields have been about 0.4 tons per hectare more on ICT area. ICT area should approach 50 percent of sown area in 1984, up from 1.1 million hectares in 1983. [Thomas Bickerton (202) 475-4509]

POTATOES AND FRUIT UP; VEGETABLES DOWN

Potato production, at 83 million tons, rose 6 percent from 1982, but was below plan by 6 million tons. Total fruit production in 1983 probably reached a record 18.5 million tons, but still was 200,000 tons short of plan. Vegetable production fell a million tons below the 1982 record of 30 million tons. To encourage higher production of these products, the Government (1) in August 1982, began allowing farms to sell up to 10 percent of their planned output directly to consumer cooperatives, and in collective farm markets, probably at higher prices than could be obtained from the government; and (2) on January 1, 1983, boosted its prices for purchases of these products from farms.

Post Harvest Losses

Influenced by the directives of the Food Program, the problem of high losses of perishable vegetables and fruit during transport and storage received more than normal attention in the Soviet press in 1983 and was a chief concern of the Ministry of Fruit and Vegetable Growing.

One journal (*Literaturnaya gazeta*, *Literary Gazette*, no. 30, 1983) reported that: "Between 20 and 30 and even as much as 50 percent of the harvest is lost....Up to 35 percent of cabbage rots....Losses of carrots sometimes reach 40-50 percent....The loss of raw materials in the country's canning industry every year amounts to as much as 60 percent of the fruit, berries, and vegetables entering the canning factories." Despite some efforts to resolve this problem (for example, increasing the numbers of special river-going vegetable transporters equipped with refrigeration and also refrigerator trucks), spoilage and losses reportedly still remain high. Another problem affecting use, and brought to the forefront in 1983, was pilferage of vegetables and fruit while in transit by water and rail. For example, to prevent pilfering produce off cargo ships on the Volga River, special teams of personnel were formed in 1983 to inspect and to ensure the security of cargoes. Reportedly, numerous violations were uncovered (*Sovetskaya Rossiya*, *Soviet Russia*, August 14, 1983). Unarmed guards, placed on railroad refrigerator cars in other areas to prevent pilfering, reported, "it has come to the point where they have begun stealing in broad daylight...we can't take responsibility for guarding it [the cargo]." (*Literaturnaya gazeta*, no. 36, 1983).

Despite the continued high percentage of losses and spoilage of these crops from the time they leave the fields until they arrive at retail outlets, the relatively large domestic output in 1983, together with increased imports over 1982, will raise per capita consumption. The increase, however, will still leave per capita consumption of vegetables about 20 percent below the recommended nutritional norm, and fruits and berries consumption 46 percent short (Table). With potato consumption at the recommended norm, it is probable that more of the 1983 crop was left on farms, most probably for livestock feed in the private sector. A larger portion of the potatoes purchased by the Government from farms probably went into industrial use, such as the manufacture of starch.

Prospects for Future Production

After several years of decline, potato area has stabilized in the past 3 years. In 1983, 90 percent of the output increase was due to a 6-percent rise in yields, because the area increased only 0.4 percent. Implementation of the ICT method on potato farming was a major reason for the improvement in yields, and its expansion should continue. [Angel O. Byrne (202) 475-4505]

COTTON PRODUCTION DOWN AGAIN

Cotton production in 1983 totaled 9.2 million tons (seed cotton basis), down 1 percent from 1982's reduced crop. Yields were the lowest since 1978. On a lint basis, output was above 1982 and reached 12.5 million bales, because the ginning rate and lint quality improved. The growth rate of the cotton area dropped sharply and was the lowest in 11 years.

Late-Ripening Crop

The cotton area, at 3,189,000 hectares, grew only 1,000 hectares from 1982—far below the average annual growth rate of close to 21,000 hectares during 1981-82. A more acute irrigation-water supply shortage in the cotton-growing regions of Soviet Central Asia was a key factor in the 1983 slowdown. After a record pace in seeding, early to midsummer rains and below-normal cool weather delayed plant development and resulted in a late-ripening crop. Also, unusually hot weather beginning in midsummer hurt midlevel boll development in many areas. Because of the uneven ripening of cotton bolls, hand-picking had to be extended considerably—another factor leading to the slow 1983 harvest. A positive outcome was, however, that the increase in hand-picking greatly reduced the amount of boll damage and the amount of trash usually resulting from mechanical harvesting. This undoubtedly helped enhance seed cotton quality and, in turn, fiber quality. It is estimated that the ginning rate for the 1983 crop rose to 29.5 percent, compared with an estimated 28 percent for the poor-quality 1982 crop.

Fiber Quality and Consumption Trends

The Soviets continue to express concern over declining raw cotton and fiber quality. In 1983, they proposed to change the system of Government payments to farms for raw cotton from strictly the bunker weight of cotton delivered to procurement points to a system that would base payments on the amount of the fiber produced.²¹ As one Soviet official stated, "It is time to stop paying...according to the weight of collected raw cotton....There is a weight race in progress....What does this lead to? The amount of dirty raw cotton increases sharply, while seeds become crushed....If the cotton growers are paid according to the quantity and quality of fiber produced...then, presumably, the cotton growers and textile workers will have common interests." On January 1, 1983, Government prices for raw cotton purchased

USSR lint cotton production and trade

| Year beginning August 1 | Lint cotton production | Imports | Exports | Net exports | Supplies for domestic use ¹ |
|----------------------------|---------------------------|---------|--------------------------|-------------|---|
| | | | 1,000 bales ² | | |
| 1978/79 | 11,907 | 354 | 3,756 | 3,402 | 8,505 |
| 1979/80 | 12,833 | 296 | 3,770 | 3,474 | 9,359 |
| 1980/81 | 13,498 | 153 | 4,070 | 3,917 | 9,581 |
| 1981/82 | 13,277 | 110 | 4,295 | 4,185 | 9,092 |
| 1982/83 | 11,939 | 400 | 3,300 | 2,900 | 9,039 |
| 1983/84 | 12,500 | 250 | 3,200 | 2,950 | 9,550 |

¹ Production minus net exports. ² 480-pound bales.

from farms did rise 5.6 percent, but the price increase evidently was still based on bunker weight.

Soviet per capita cotton cloth consumption for all purposes has remained at about 30 linear meters for several years. The plateau is supply not demand bounded. Although production of man-made fiber fabrics has been rising in recent years and availabilities for domestic use have shown larger percentage gains than for cotton cloth, per capita consumption of cotton cloth far exceeds that for man-made fabrics. With Soviet consumers continuing to prefer cotton fabrics to man-made fabrics, it is evident that cotton will continue to hold a major position in Soviet textiles for some time to come.

Cotton Area Near Practical Limits

The existing demands on irrigation water in Soviet Central Asia will restrict much further expansion of the total cotton area, which very likely will stabilize at around 3.2 million hectares for some time. Thus, more emphasis will have to be placed on obtaining higher output through yields. Despite weather induced year-to-year variability, the trend has been for yields to increase about 2 percent annually since 1966, because higher yielding varieties have been developed and fertilizer application has increased. [Angel O. Byrne (202) 475-4505]

USSR TRADE GROWTH SLOWS

In 1983, the 7-percent increase in the value of Soviet trade to about 127 billion rubles (\$176 billion) was the lowest in a decade. Imports and exports grew roughly at the same rate, reaching close to 60 billion rubles (\$83 billion) and 68 billion rubles (\$94 billion), respectively. The Soviets recorded a 4.3-billion ruble trade surplus with nonsocialist trading partners, mostly with developing countries. Energy sales, which generally account for 70 percent of all Soviet hard currency earnings, are thought to have increased slightly. Prices remained relatively unchanged on the higher volume of Soviet deliveries of oil to the West. Agricultural imports, which have accounted for 25 percent of Soviet purchases made abroad in recent years, are estimated to have declined \$1.7 billion in 1983, largely because of improved domestic production of grain and sugar. The Soviets were able to reduce their sales of gold to about 50 to 60 tons, in con-

| USSR foreign trade | | | |
|---------------------------------------|------|------|------|
| Direction | 1981 | 1982 | 1983 |
| <i>Billion rubles</i> | | | |
| Exports | 57.1 | 63.2 | 67.9 |
| To socialist countries ¹ | 31.2 | 34.2 | 37.7 |
| To Western industrialized countries | 17.2 | 18.8 | 19.7 |
| To developing countries | 8.7 | 10.2 | 10.5 |
| Imports | 52.6 | 56.4 | 59.6 |
| From socialist countries ¹ | 26.7 | 30.8 | 33.7 |
| From Western industrialized countries | 18.1 | 18.9 | 18.7 |
| From developing countries | 7.8 | 6.7 | 7.2 |

¹Includes Eastern Europe, Cuba, Mongolia, North Korea, PRC, and Vietnam.

USSR agricultural imports, by value¹

| Commodity | 1981 | 1982 | 1983 |
|-----------------------------------|----------|----------|--------|
| <i>Million dollars</i> | | | |
| Grain and grain products | 8,366.2 | 6,720.9 | 6,000 |
| Sugar | 3,940.2 | 4,366.5 | 3,300 |
| Meat and dairy products | 1,790.4 | 1,583.6 | 1,600 |
| Fats and oils | 1,155.2 | 980.8 | 1,000 |
| Fruits, vegetables, and nuts | 1,466.3 | 1,453.1 | 1,400 |
| Tobacco and products | 865.4 | 919.5 | 1,000 |
| Oilseeds and oilmeal ² | 911.5 | 903.2 | 1,000 |
| Other | 2,409.3 | 2,399.5 | 2,700 |
| Total | 20,904.5 | 19,327.1 | 18,000 |

¹Derived from USSR official data for 1981 and 1982 and ERS estimates for 1983. ²Estimated.

trast to 1982 when they sold about 200 tons. The Soviets generally regard their trade surplus with socialist countries as a liability. Their export surplus with socialist countries totaled 4.0 billion rubles in 1983.

Agricultural Trade

The most recently published Soviet trade statistics cover 1982.²² They reveal a decline in agricultural imports to about \$19 billion, 8 percent less than in 1981 and ending a 4-year trend of agricultural import growth (tables 10 and 11). Most major agricultural imports except sugar and tobacco declined. Grain imports recorded the largest drop. Sugar imports expanded as the Soviets took advantage of low world prices. The quantity of soybean and soybean meal imports remained high. Although Western countries dominate the grain and oilseed trade, Eastern Europe continues to be the primary supplier of meat, milk, fruits, and vegetables (table 12). In 1982, the United States supplied one-fourth of all Soviet wheat imports and 43 percent of all Soviet coarse grain imports, ranking the United States second behind Canada among wheat suppliers, and first among coarse grain suppliers. The United States supplied 43 percent of soybean imports. Soviet agricultural exports declined 7 percent to \$2.8 billion (tables 13 and 14).

Soviet agricultural imports in 1983 probably declined to about \$18 billion primarily because of lower sugar and grain imports. However, increases in cotton, animal products, and oilseed meal imports slowed the overall decline in imports. Soviet agricultural exports are also estimated to have declined, largely because of the quality problems with their 1982 cotton crop.

Grain

Soviet grain imports in 1983 are estimated at 34 million tons. Wheat dominated Soviet grain imports in 1983 for the second year in a row as a result of reduced wheat output and a bumper coarse grain harvest. These buying practices possibly reflect Soviet domestic policies—expressed in price changes and area reallocations—to shift its relative import dependence away from coarse grains. Rationale for such a policy would be that wheat imports can be more easily diversified by source. Another factor was the more favorable world price of wheat relative to coarse grains.

The Soviets have entered 1984 with grain stocks still below desired levels. Attainment of ambitious livestock production targets will require increased grain-for-feed allocations. For these reasons, a modest increase in production above 1983's would likely have only a slight downward influence on Soviet grain imports in 1984/85.

Soviet Grain Buying Arrangements

The USSR currently has long-term grain trade agreements for annual imports of roughly 19 million tons through 1985. Besides the recently negotiated agreement with the United States, agreements are in place with Argentina and Canada. The Argentine agreement calls for minimum imports of 4 million tons of coarse grain each calendar year through 1985. The 5-year Canadian agreement, which was initiated on August 1, 1981, called for minimum grain imports of 4 million tons the first year, increasing by 500,000 tons annually. So for the current Canadian-agreement year, the minimum has increased to 5 million tons and will reach 6 million tons in the concluding year of the agreement. Past Canadian trade has generally been dominated by wheat. An agreement with Brazil calls for 500,000 tons of corn beginning in 1983 through 1986, but so far, shipments have been smaller. Hungary, as part of a broad package of bilateral trade arrangements with the USSR, has agreed to supply roughly 800,000 tons of grain a year from 1981 through 1985. In case of a poor Hungarian harvest, though, this commitment would not be binding. Recent trade data indicate nearly all Hungarian grain exports to the USSR are wheat. This agreement is likely to be renewed for 1986-90. Other East European nations, notably Bulgaria and Romania, can be expected to provide the USSR in excess of 1 million tons following favorable harvests. Though this trade is not part of formal long-term agreements, it is generally given higher priority than above-minimum imports from Western suppliers.

To supplement these long-term trade arrangements, the Soviets have recently concluded annual trade agreements with Australia for 1.5 million tons of wheat, with Thailand for 700,000 tons of rice and 100,000 to 200,000 tons of corn, and with Austria for 125,000 tons of wheat. This combination of long-term agreements (including the 1983 U.S. agreement), annual agreements, and special trade relations with Eastern Europe guarantees the USSR minimum grain imports of 21 to 23 million tons through 1985. [Edward Cook (202) 475-4508]

Sugar

Sugar imports in 1983 are also estimated to have declined to about 5.4 million tons (refined value). The better 1982 sugarbeet crop permitted the Soviets to cut imports about a fifth. Cuba is estimated to have provided about 60 percent of 4.8 million tons of raw sugar imported by the Soviets. Large sugar imports from Cuba are taken as payment for Soviet petroleum exports. Brazil, Nicaragua, Argentina, the Philippines, and the Dominican Republic are likely to have supplied the bulk of the remainder, following the pattern set in recent years.

Livestock

Despite the strong gains made in livestock product output in 1983, imports of meat and meat products and

USSR Net Grain Trade¹

Million tons



△ Estimate. ¹Excludes rice, flour and groats.

butter rose. Imports of eggs and cheese probably fell somewhat below 1982 levels, and imports of wool (scoured) probably remained about the same. Meat imports rose to a record 985,400 tons. Meat purchases from Romania, Bulgaria, and Hungary may have been up in 1983 because of these countries' difficulties in marketing in the West or the need to balance accounts with the USSR. In 1983, the Soviets made no frozen red meat purchases from Australia. Instead, they turned to New Zealand where they were able to buy at much cheaper prices, and are expected to do so again in 1984. Other major suppliers of fresh, frozen red meat in 1983 probably were Argentina, France, and Mongolia. Major suppliers of frozen poultry meat to the USSR traditionally have been Hungary, Brazil, Bulgaria, the Netherlands, and Denmark. The East European countries are the main suppliers of canned meat and canned meat with vegetables.

Despite the record domestic butter output, imports in 1983 rose 34 percent above 1982's reduced level to 202,600 tons. In 1982, the major butter suppliers were New Zealand, the Netherlands, Ireland, and Finland. Estimated record production of domestic cheese probably resulted in a slight drop in 1983 imports.

Between 1979 and 1982, egg imports dropped over 30 percent. With the continuing upward trend in domestic egg production, imports probably continued to drop. With a small gain in wool production, wool (scoured) imports in 1983 probably remained at about 1982's slightly reduced level of 125,000 tons.

Oilseeds

Oilseed imports are estimated to have declined in 1983

because of the larger 1982 sunflowerseed crop. Soybean imports are believed to have fallen about 14 percent to 1.3 million tons. Soybean meal imports, which likely made up over 90 percent of oilseed meal imports, are estimated to have increased from 1.7 million tons in 1982 to 2.6 million tons in 1983. Brazil and the Netherlands again supplied the bulk of Soviet needs.

In 1983, Soviet vegetable oil imports declined 18 percent to 707,800 tons, which is attributed to the larger 1982 domestic oilseed supply. About 50 percent of 1983 vegetable oil imports were made up of sunflower oil and palm oil.

Fruits and Vegetables

About 7 percent of USSR food import expenditures are for fruits and vegetables. Imports of fresh vegetables in 1983 rose 4 percent to 180,600 tons, while imports of fresh fruit dropped 3 percent to 1.123 million tons. The larger proportion of trade was done with Eastern Europe.

Cotton

Following the poor quality of the 1982 cotton crop, the USSR in 1983 was forced to cut cotton lint exports and to significantly raise imports—mostly from nontraditional suppliers. Soviet cotton lint exports in 1983 are estimated at 770,000 tons, almost 20 percent below 1982. Imports in 1983 are estimated to have reached 130,000 tons, five times 1982. In early 1984, as in early 1983, the Soviets turned to nontraditional suppliers to purchase cotton lint. By March 29, they had bought 262,000 bales from the United States.

[Thomas Bickerton, Angel O. Byrne, and Edward Cook (202) 447-8380]

U.S.-USSR TRADE

In 1983, U.S. exports to the USSR were valued at \$2.0 billion (without adjustments for transshipments), their lowest since 1980 (table 15). The value of U.S. imports from the USSR increased to \$341 million. Two-thirds of all U.S. imports from the USSR in 1983 were made up of anhydrous ammonia, light fuel oils, palladium, and urea.

U.S. grain exports to the USSR

| Year/Values | Wheat | Corn |
|-----------------|-------|-------|
| 1982 | | |
| Million tons | 4,295 | 7,127 |
| Million dollars | 802 | 835 |
| Dollars/ton | 187 | 117 |
| 1983 | | |
| Million tons | 4,836 | 3,032 |
| Million dollars | 801 | 404 |
| Dollars/ton | 166 | 133 |

U.S. Agricultural Exports and Imports

Agricultural commodities continued to account for more than 70 percent of all U.S. exports to the Soviet Union. Although agricultural exports declined about one-fifth to \$1.5 billion, their magnitude was large enough to rank the USSR as the sixth largest purchaser of U.S. farm commodities in 1983. The USSR purchased 4 percent of all U.S. agricultural exports.

Wheat and corn, which generally account for over 80 percent of U.S. agricultural exports to the USSR, remained the principle items. U.S. exports of wheat, at 4,836 million tons, were valued at \$801 million. Corn exports, at 3,032 million tons valued at \$404 million, were down significantly from 1982. U.S. sales of soybeans, 569,000 tons, were valued at \$159 million.

Although grain and soybean sales were down in 1983, U.S. cotton exports to the USSR increased from 48 tons in 1982 to 45,000 tons, valued at \$72 million. Tallow rose by one-fifth to \$21.5 million. Sales of U.S. animal hides totaled \$10.6 million in 1983 after no sales in 1982. Almond sales declined more than three-fourths, to \$2 million.

U.S. agricultural imports from the USSR amounted to \$10 million. The most important commodity was sable furskins valued at \$8 million.

New Long-Term Grain Agreement

At the beginning of 1983, the United States had not announced whether it would seek to negotiate a new

U.S. trade with the USSR¹

| Year | U.S. exports | | | U.S. imports | | |
|-------------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| | Total | Agricultural | Nonagricultural | Total | Agricultural | Nonagricultural |
| Million dollars | | | | | | |
| 1972 | 542 | 430 | 112 | 88 | 4 | 84 |
| 1973 | 1,191 | 920 | 271 | 204 | 5 | 199 |
| 1974 | 607 | 300 | 308 | 334 | 9 | 326 |
| 1975 | 1,834 | 1,133 | 701 | 243 | 7 | 236 |
| 1976 | 2,306 | 1,487 | 819 | 215 | 8 | 206 |
| 1977 | 1,621 | 1,037 | 584 | 221 | 11 | 210 |
| 1978 | 2,249 | 1,687 | 563 | 530 | 12 | 517 |
| 1979 | 3,604 | 2,855 | 749 | 873 | 15 | 858 |
| 1980 | 1,510 | 1,047 | 463 | 431 | 10 | 421 |
| 1981 | 2,430 | 1,665 | 765 | 357 | 12 | 345 |
| 1982 | 2,589 | 1,855 | 734 | 229 | 11 | 218 |
| 1983 ² | 2,002 | 1,457 | 545 | 341 | 10 | 331 |

¹No adjustments made for transshipments. ²Preliminary.

long-term grain agreement with the Soviet Union or let the 1975 pact expire. The 1975 agreement was then in its second 1-year extension, and the President had postponed negotiations towards a new agreement in a series of economic sanctions directed to the USSR in response to its involvement in the repression in Poland.

The Soviets curtailed their usual pattern of grain imports from the United States. From October through December 1982, no wheat was shipped to the USSR, down from 1.3 to 1.9 million tons shipped during each of the same 3 months in 1979, 1980, and 1981. From March through June 1983, corn shipments were only 6 percent of their level during the same period in 1982. The Soviets held their purchases to near the minimum called for in the 1975 agreement. This buying behavior, along with other Soviet long-term agreements, expanded capacity by other exporters to service the Soviet market, and projections of long-term grain needs in the USSR, fueled concern that without an agreement, the USSR might purchase no grain at all from the United States in some future years. In the U.S. Senate, a resolution was pending calling on the administration to begin negotiations towards a new long-term agreement.

On April 22, the President announced that the United States was willing to begin negotiations with the Soviet Union on a new agreement. On May 17, U.S. officials announced that the Soviets had accepted the proposal. Negotiators met for the first time on June 2, and on July 28, the United States announced that an agreement in principle had been reached. On August 25, the new agreement was signed.

Under its terms, the Soviets agree to purchase at least 4 million tons of wheat and 4 million tons of corn annually for each of 5 agreement years beginning October 1, 1983. In addition, the Soviets agreed to annually purchase either (1) another million tons of wheat and/or corn or (2) at their option, soybeans and/or soybean meal at a ratio of 1 ton of such products for 2 tons of grain. An additional 3 million tons of either wheat or corn may also be purchased without government-to-government consultations. (The full text of the agreement is shown in the appendix.)

With the signing of the agreement, the Soviets resumed purchases from the United States. By April 19, 1984, reported U.S. sales to the Soviet Union were over 4.2 million tons of wheat and about 6.2 million tons of corn, exceeding the agreement minimum. During the regular semiannual consultation specified in the agreement, held on January 24 and 25 in London, the United States offered the Soviets an additional 10 million tons, bringing the total U.S. offer to 22 million tons for the current agreement year.

Although the soybean/soybean meal clause in the grain agreement does not require any minimum purchase of those commodities by the Soviets, it is generally considered a positive sign that the Soviets will remain a purchaser of U.S. soybeans and may consider importing U.S. soybean meal. As of April 19, 1984, the Soviets had purchased 416,200 tons of soybeans. With grain purchases already above 9 million tons, the Soviets have no need to exercise the soybean option against grain.

Besides the change in minimum import commitments, the new long-term agreement dropped Article V, which

USSR: Grain-buying activity (Grain-agreement year—October/September)

| Year | U.S. Offer to Sell | USSR Purchase from U.S. | | |
|--------------|-----------------------|-------------------------|------------------|-------------------|
| | | Wheat | Corn | Total |
| Million tons | | | | |
| 1976/77 | ¹ 8 | 3.1 | 3.0 | 6.1 |
| 1977/78 | 15 | 3.5 | 11.1 | 14.6 |
| 1978/79 | 17 | 4.0 | 11.5 | 15.5 |
| 1979/80 | ² 25 | 2.2 | 5.8 | 8.0 |
| 1980/81 | 14 | 3.8 | 5.7 | 9.5 |
| 1981/82 | 23 | 6.1 | 7.8 | 13.9 |
| 1982/83 | 23 | 3.0 | 3.2 | 6.2 |
| 1983/84 | 22 | ³ 4.2 | ³ 6.2 | ³ 10.4 |

¹Soviets were also told that the 1976 U.S. grain crop was adequate to meet their needs. ²U.S. offer in excess of 8 million tons later withdrawn. ³Purchases reported as of April 19, 1984.

had provided the United States with an "escape-clause" in the event of a very significant drop in U.S. grain supplies. The article was never used in the 7-year history of the 1975 agreement. A new Article VI reflected U.S. government willingness to be of assistance on questions of grain quality. Otherwise, the new agreement followed the form and substance of the 1975 pact.

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Soviet Trade in Agricultural Technology

Although discussion of USSR agricultural trade tends to focus on grain imports from the United States, the Soviets have been important traders in agricultural technology. Their first tractor plants were designed by U.S. firms. During the 1970's, the Soviets turned to Western sources to upgrade mineral fertilizer production. The expansion of their poultry industry and cattle feedlots started with U.S. prototypes, and their imports of insecticides and herbicides include Western-developed compounds.

Based on preliminary examination of Soviet statistics, which probably capture no more than a minimum of embodied technology (and at best only a small part of unembodied technology, such as the cost of seminars, purchased production licenses, design assistance, etc.), Soviet imports of agricultural technology nearly tripled between 1975 and 1982, increasing from \$970 million to \$2.7 billion. Soviet imports of agricultural commodities were much larger, but merely doubled in the same period.

The Soviets have been anxious to learn more about the use of soybean meal in animal rations, the use of soy isolates as meat extenders, and a wide range of other U.S. technologies dealing with cultivation and soil conservation, veterinary medicine and instruments, mechanized cultivation and harvesting of row crops, plant protectants and growth regulators, and automatic control systems for meat packing plants and dairies. The number of U.S. firms represented at the Agribusiness-USA exhibition in Moscow in October 1983, and U.S. business interest in the Selkhoztekhnika-84 international exhibition of agricultural machinery, equipment, and instruments in Moscow this spring suggest that U.S.-Soviet ties in agricultural technology are likely to expand.

AGRICULTURAL INVESTMENT AND DOMESTIC POLICY

Total State expenditures in 1983 on the APK, at close to 130 billion rubles, almost equal the Soviet figure for the value of total agricultural production from both State and private sources. The APK accounts for 36 percent of total State expenditures in both 1983 and 1984. The agriculture sector accounts for 75 percent of total APK expenditures, which in 1984 are planned to show a 1-percent decrease over the 1983 plan.

Industries supporting agriculture were among some of the fastest growers in 1983. Output in industries producing mineral fertilizers was up 10 percent, and output of machinery for the livestock and feed sector was up 7 percent. Output in the tractor and agricultural machine building industry rose 5 percent. Overall investment in support industries since 1980 has probably only modestly exceeded the 1976-80 average. However, investments for fertilizers and agricultural machinery have probably increased a good deal, as they are frequently cited as priorities in articles on annual plans and have had large planned increases in investment in 1983 and 1984. Nevertheless, investment in the APK, and particularly in the industries supporting agriculture, has proved to be a difficult area for analysis because of inconsistencies in Soviet data.

Investment in the APK

The concept of an APK as a separate planning entity in the USSR is a new one, dating only to the beginning of the current 5-year plan. Previously, published data on capital investment centered on agriculture alone, or on industry alone. For this reason, data given in *Finansy SSSR (USSR Finance)* (July 1982) was valuable because it showed capital investment in the APK for 5-year plan periods going back to 1961-65. This data, partially repeated in *Ekonomicheskiiye nauki, Economic Science*, (translated in JPRS USSR Report, *Agriculture*, no. 1381) showed a decline in planned investment for the APK, from 242 billion rubles in 1976-80 to 233 billion in 1981-85. Because the Soviets had been stressing the need to improve efficiency in the APK, the apparent decrease in investment was a puzzle of some significance, especially

Capital investment in APK

| Year | Total complex | Agricultural sector ¹ | Related industries ² |
|-------------------------------|---------------|----------------------------------|---------------------------------|
| <i>Billion rubles</i> | | | |
| 1976-80 actual | 213.0 | 171.0 | 42.0 |
| 1981-85 5-year plan | 233.0 | 190.0 | 43.0 |
| 1981-85 plan (annual average) | 46.6 | 38.0 | 8.6 |
| 1981 actual | 45.8 | 37.2 | 8.6 |
| 1982 actual | 45.6 | 38.3 | 7.3 |
| 1983 actual | 48.0 | 40.0 | 8.0 |
| 1984 plan | 49.4 | 38.0 | 11.4 |

¹Includes State and collective farms and intra-farm enterprises. ²Includes input industries such as farm machinery, fertilizers, pesticides, and preliminary processing industries such as sugar refinement, cotton ginning, and wheat milling.

Source: *Narodnoe khozyaistvo SSSR 1982* and *Sotsialisticheskaya industriya* (January 29, 1984).

because the decrease seemed centered in the industries that were expected at the forefront of improved agricultural efficiency.

The puzzle took on a new character when the Soviet statistical yearbook, *Narodnoe khozyaistvo SSSR v 1982, USSR National Economy in 1982*, appeared and reported capital investment in the APK during 1976-80 at 213 billion rubles, 29 billion rubles less than originally reported with the decrease in the residual category of industries serving agriculture. If this was a revision of the original data, it would show investment in the industries serving agriculture essentially stable, at 42 billion rubles in 1976-80 and at 43 billion rubles during 1981-85.

A second discrepancy exists between the investment data for 1983 as reported in the agricultural economic journal *Ekonomika sel'skogo khozyaistva* (no. 1, 1984) and in the 1983 plan-fulfillment report. According to the latter source, investment in agriculture was 40 billion rubles in 1983; according to the former, it amounted to 38.5 billion rubles. The difference has a large impact on the residual category of industries serving agriculture, which would show either 8 billion or 9.5 billion rubles invested in 1983.

The data also show about 6 percent over-plan investment in the agricultural sector in 1983. Farms probably had more discretionary funds to invest in 1983 as a result of the increased procurement prices and bonuses. Investment funds may have been redirected during the year as ministries made their cases for adjustments.

These kinds of discrepancies have made the direction of Soviet investment policy in agriculture and its related industries particularly hard to analyze. Probably, however, the APK already exerts a significant claim on Soviet investment resources, and the Soviets are finding it difficult to manage the amount. In a country where labor productivity in agriculture is estimated at but one-tenth that in similar climatic areas of North America, the room for management improvement would seem tremendous.²³

Agricultural Equipment

Tractor deliveries to farms increased 6 percent in 1983, as did truck deliveries (table 16). Grain combine deliveries were up 5 percent. Corn combine deliveries were up 21 percent to 1,700 units, supporting the expansion of the corn area. The 16-percent increase in investment in agricultural machinery in 1983, plus the 34-percent increase set for this year, should provide a longer basis for improving the quantity, and more especially the quality, of agricultural equipment. The 1984 goal is to deliver more than 380,000 tractors to farms. Grain combine deliveries are set to be about the same level as in 1983. Production of equipment for livestock and fodder production is set to increase 5.3 percent. A 4.3-percent increase in agricultural machinery production is planned for 1984 (*Planovoe khozyaistvo*, no. 2, 1984).

According to Soviet data and analysis, the agricultural equipment situation is sorely in need of substantial improvement. An *Izvestiya* article stated that to adequately equip farms required twice the current machinery output.²⁴ Another article estimated that to be adequately equipped in 1990 would require the

development of 600 specialized equipment types and implement attachments. However, it also pointed out that often development of new machinery takes up to 10 to 15 years.²⁵ Besides a lack of numbers and types of farm equipment, the quality of new equipment deliveries and spare parts must be abysmal according to anecdotal evidence. Chairman of the APK Department of the State Planning Committee stated that new combines must often be dismantled and reassembled upon delivery to get them to function properly.²⁶ Rejects among spare parts are 10 to 12 percent of distribution.²⁷ The shortage of quality spare parts causes machine down-time for repairs to be high and leads to cannibalizing equipment for parts. One source indicates that 45 percent of tractor deliveries are simply for replacement.²⁸ Comparison of data on inventories and deliveries indicates an even higher replacement rate. Soviets report that they spend twice the purchase price of tractors to keep them in repair during a normal lifetime, and up to four times the cost of trucks.²⁹

The lack of hard surface rural roads worsens the problem. One source puts agricultural production losses at 5 to 7 billion rubles annually due to transportation problems, and estimates that on average each truck in rural areas is out of service 40 days a year because of road-related damage.³⁰ For every 1,000 hectares of agricultural land, farms have only 1.2 kilometers of on-farm hard surfaced roads.³¹

Agrochemicals

Mineral fertilizer production (29.7 million tons) and deliveries (23 million tons) were up 11 and 14 percent, respectively, in 1983, showing much higher growth rates than experienced since the early 1970's (tables 17 and 18). The Soviets complain of insufficient fertilizer availability, although Soviet fertilizer use exceeds that in the United States in some similar climactic regions.³² However, poor quality of preparations, insufficient storage facilities, lack of formulated mixtures, and the inadequate equipment and expertise for farm application limit the nutrients' effectiveness and may even make them counterproductive. The storage capacity for fertilizer is only 43 percent of need.³³ Collective and State farms receive only 60 to 65 percent of needed phosphorus.³⁴ The coefficient of plant nutrient use for phosphorus does not exceed 20 to 25 percent.³⁵ One article has stated that potassium remains the most deficient nutrient and limits the efficiency of nitrogen and phosphorus, despite the fact that the Soviets annually export about 3 million tons (raw weight), largely to Eastern Europe.³⁶ In 1982, farms had only 17 to 20 percent of required fertilizer applicators.³⁷

Soviet plans call for only a 5-percent increase in fertilizer production. The Soviets are relying in part on "turn key" plants to help improve the fertilizer situation. New plants from Czechoslovakia are planned for ammonia and urea. Soviet deliveries in 1984 are planned to increase only 1 percent. This implies that only 20 percent of production increase is scheduled to reach farms. The 24-percent increase in capital investment for fertilizer production should help the Soviets make some progress in the midterm in improving the quality and diversity of fertilizer preparations.

Production of agricultural pesticides totaled 557,000 tons in 1983, up 4.5 percent from a year earlier. A 4-percent

increase is planned for 1984. As with fertilizers, the range of formulations are limited. For example, the Soviets compared their own 53 assorted compounds to the more than 500 varieties in the United States and the Federal Republic of Germany.³⁸ Fewer varieties and continued application of obsolete compounds reduce effectiveness as the target pests develop resistance. The 10-percent increase in deliveries of feed additives in 1983 aided the gains in the livestock sector.

Storage Facilities

A recent Soviet report estimated that inadequate storage caused losses of several billion rubles each year.³⁹ Only 36 percent of storage requirements for all agricultural commodities are satisfied according to one Soviet source.⁴⁰ Only 66 percent of requirements for standard grain elevators are met. Vegetable and potato storehouses have capacity for only 32 percent of normal requirements, while fruit storehouses meet only 47 percent, and silage and haylage facilities only 40 percent. Capital investment for fruit and vegetable storage is to be increased 13 percent in 1984; and for fodder storage, 11 percent.

Land and Water Resources

Sown area in 1983, at 212.8 million hectares, was the lowest since 1972. The primary reason for the decline was the increase in clean summer fallow as the Soviets pull back from the mid-70's policy of increasing grain area at fallow's expense. That policy had a negative impact on the levels and stability of yields.

Application of mineral fertilizer to selected crops, and percentage of the crop fertilized, USSR¹

| Year | Grain excluding corn | Corn for grain | Cotton | Sugar- beets | Potatoes |
|------------------------------|----------------------------|----------------------|--------|-----------------|----------|
| <i>Kilograms per hectare</i> | | | | | |
| Rate | | | | | |
| 1974 | 40 | 124 | 367 | 299 | 229 |
| 1975 | 42 | 155 | 391 | 399 | 280 |
| 1976 | 47 | 145 | 393 | 459 | 254 |
| 1977 | 48 | 135 | 395 | 469 | 274 |
| 1978 | 51 | 180 | 433 | 483 | 287 |
| 1979 | 49 | 192 | 410 | 451 | 274 |
| 1980 | 51 | 215 | 417 | 438 | 274 |
| 1981 | 51 | 211 | 417 | 425 | 278 |
| 1982 | 54 | 182 | 384 | 445 | 284 |
| <i>Percent</i> | | | | | |
| Share fertilized | | | | | |
| 1974 | 48 | 94 | 98 | 98 | 91 |
| 1975 | 48 | 94 | 99.5 | 99.4 | 93 |
| 1976 | 50 | 92 | 99.5 | 99.5 | 94 |
| 1977 | 52 | 89 | 99.4 | 99.5 | 94 |
| 1978 | 54 | 94 | 99.6 | 99.4 | 94 |
| 1979 | 53 | 94 | 97 | 99 | 93 |
| 1980 | 57 | 95 | 94 | 99 | 93 |
| 1981 | 58 | 94 | 99.6 | 99 | 93 |
| 1982 | 59 | 93 | 100 | 99 | 93 |

¹Nutrient weight basis.

Source: *Vestnik statistiki*, various issues.

Irrigated and drained land, total and additions

| Year | Irrigated | | Drained | |
|--------------------------|-----------|--------------|----------|--------------|
| | Year End | Commissioned | Year End | Commissioned |
| <i>Thousand hectares</i> | | | | |
| 1976 | 15,100 | 786 | 14,400 | 726 |
| 1977 | 15,800 | 860 | 15,100 | 830 |
| 1978 | 16,300 | 760 | 15,700 | 680 |
| 1979 | 16,700 | 700 | 16,300 | 760 |
| 1980 | 17,500 | 700 | 16,900 | 650 |
| 1981 | 18,000 | 660 | 17,000 | 700 |
| 1982 | 18,600 | 640 | 17,500 | 700 |
| 1983 | NA | 710 | NA | 725 |

NA = Not available

The current 5-year plan calls for only a 1-percent increase in investment in land reclamation. However, progress in bringing newly irrigated and drained land into production was the greatest since 1978 and was above 1983 targets. Newly irrigated land was 710,000 hectares, 11 percent above the previous year. However, even if the Soviets attain the 1984 goal of 666,000 hectares, reaching the 5-year goal would require almost an additional million hectares of irrigated land to be brought into production during 1985. Drainage projects are likewise behind 5-year goals, despite 725,000 drained hectares brought into production in 1983 and 700,000 planned for 1984. Land reclamation efforts are apparently partially offset by the deterioration of old systems and conversion of land to nonagricultural uses.

Management Initiatives

The Soviets seek to increase labor productivity and reduce waste by expanding integration between farms and both suppliers and processing industries. As part of the Food Program, rayon agro-industrial organizations (RAPO's) were established nationwide in 1982. The RAPO's are councils of farm managers, directors of agricultural service industries, and agricultural ministry officials, constituted at rayon (county) levels. The RAPO's and similar bodies at the oblast, republic, and national level are to provide greater integration in planning and managing in the APK and replace other management committees. Throughout 1983, Soviet officials exhorted the RAPO members to make the organizations more than pro forma entities.

In July, a resolution was issued in order to tie the financial interests of organizations that service farms (such as equipment, agrochemical, irrigation, and procurement enterprises) to those of the farms. One performance indicator for servicing enterprises would be the success of State and collective farms in meeting their production plans. Fines and bonuses would provide the incentive. In August, the USSR Council of Ministers approved regulations aimed at providing better supplies to farms including stiffer requirements and penalties regarding warranty services. Improvements in enterprise record-keeping systems will be essential for the new regulations to be effective.

The Soviets are again emphasizing the role of small production units in increasing labor productivity. They stress that production managed through small team organizations is more efficient in terms of labor and capital productivity. A further step is to provide the teams

with greater autonomy in meeting production norms and distributing wages and bonuses. In agriculture, these units are called collective contract teams. While the number of collective contract teams has grown, the system still seems to include only a remarkably few farmworkers. In 1982, about 4 percent of agricultural workers were included in collective contract teams. More recently, an *Izvestiya* (November 19, 1983) report on progress in the APK showed only 6 percent of State and collective farm workers were under the contract principle.

Procurement Prices Increased

As noted throughout this report, government procurement prices and bonuses for many agricultural products were raised on January 1, 1983. Prices had lagged behind the increases in production costs, decreasing farm profitability for most commodities. Of the total 21-billion-ruble price and bonus increases, 16 billion rubles involved a net transfer of resources to the agricultural sector, while another 5 billion rubles were to offset the loss of farm-price subsidies on inputs such as gasoline, spare parts, and agrochemicals.⁴¹ Farms previously had preferential prices for these commodities and the input industries received direct subsidies.

The procurement price increases were differentiated by region, oblasts, and in certain districts, farms, in an effort to make farms profitable. The differentiation maintains the inefficient allocation of resources among the sectors of the economy by shielding less-efficient producers.

Because retail prices in State stores have not been raised on bread, pastas, most fish and canned foods, and meat since 1962, the procurement price increases substantially raised the level of subsidies within the food system. Subsidies for 1983 are estimated at 48 billion rubles, an amount equal to the total of capital investment in the APK, and nearly 3 times what the Soviets admit to spending on defense.⁴² Over 80 percent are for livestock, poultry, and milk production. According to an article in the Ministry of Finance periodical, the average retail price for meat (including bones) in State stores is 1.75 rubles per kilogram (about \$1.10 a pound) and butter, 3.38 rubles per kilogram (about \$2.10 a pound). At these prices, the State recoups only 35 percent of its expenditures to produce and retail the meat and 40 percent of its expenditures for butter.⁴³

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OUTLOOK FOR 1984

To the extent that the Food Program—the USSR's major effort to improve the availability of high-quality foodstuffs by 1990—was a creation of the collective leadership of the Communist Party, it is unlikely that the death of Yuri Andropov, and the succession of Konstantin Chernenko to the post of General Secretary of the Party will bring about drastic shifts in either the program or its foreign economic implications. Chernenko was an extremely ardent supporter of the program (he called it "a profound reconstruction of the national economy") before Andropov became General Secretary. Among other high-ranking party officials, Mikhail Gorbachev was an architect of some Food Program elements and is the only Politburo member whose background and responsibility specifically cover agricultural affairs. He

has been among the most active supporters of the collective contract teams. Should he become General Secretary, he could be expected to champion further institutional reforms.

The outlook for the 1984 winter grain crop is better than it was for the 1983 crop. In the northern winter grain areas, rains favored early establishment of crops, and crops entered dormancy 2 weeks later than usual after a gradual hardening process. In the southern winter grains area, some dry pockets persisted in Moldavia, the southern Ukraine, and the North Caucasus. However, many of these areas had soil moisture replenished by rains in October. But these same areas also had a sudden cold snap in mid-November that forced grains into dormancy without an optimal hardening process. Although snow cover was less extensive than needed to protect the crop in the southern portions of European USSR, the winter was mild enough that losses were only average. With the onset of spring, moisture deficits in the North Caucasus, eastern Ukraine, Volga Valley, and Central Black Soil Zone were threatening yield prospects.

Total grain area will increase very slightly, if at all. Fall-sown grains (higher yielding than spring grains) were up roughly 8 percent in area. Fertilizer availabilities for the 1983/84 crop year are well above the average for the last 5 years, and supplies of high-quality seed for this spring's grain sowing are reportedly better, except in many portions of Siberia. Some other positive factors in 1984 will be a further increase in available machinery and storage facilities, and a larger share of lands covered by the collective contract system.

Trend analysis of yields since 1965 and total area close to last year's suggests grain production above 1983's. However, moisture deficiencies in some areas indicate yield prospects slightly below trend. Most of the increased production implied by a return to trend yields would be accounted for by wheat, because winter wheat area is expected to be higher this year. A modest increase in grain production in 1984 would likely have only a slight downward impact on grain imports in 1984/85, because of anticipated stockbuilding requirements and ambitious livestock production targets.

Forage production in 1984 may equal the 1983 record crop. When combined with a higher grain-feed forecast, a mild 1983/84 winter, record livestock inventories, and continued incentives from the January 1, 1983 boost in government prices for purchases of livestock products from farms, prospects are good in 1984 for reaching new highs in livestock inventories and also for producing livestock products. With large livestock numbers on hand and expected gains in animal weights because of the improvement in the feed base, meat production could approach the 16.8 million tons (slaughter weight) planned. With the expected further improvements in milk yields per cow, milk output in 1984 could meet the 97.1 million tons planned and possibly exceed it. Butter, cheese, and egg production could also exceed record 1983 levels. Food industry output of meat and whole milk and products during the first 2 months of 1984 were up 10 and 7 percent, respectively, compared to the same period in 1983.

In 1984, sugarbeet output is expected to continue to recover from the sharp downturn that saw production

average 72 million tons over 1979-82. The Soviets are likely to hold area to 3.5 million hectares or less in 1984, and will continue to decrease beet production in areas less suited to beet cultivation, preferring to concentrate it in the RSFSR's Central Black Soil region, the Ukraine, and Moldavia. Output for 1984 is expected to continue to fall well short of the planned average annual target of 101 to 103 million tons.

Sunflowerseed output in 1984 is expected to remain near 1982 and 1983 levels, considerably below the announced average annual target of 6.7 million tons. Output for other oilseeds should show some increase. The Soviets will try to accelerate the slow pace of the soybean expansion program. Harvested area should expand to at least 900,000 hectares, allowing for an increase above 1983's 500,000-ton estimate. Progress is not likely to be much more rapid because farmers in western USSR, where much of the expansion is to be attempted, are not familiar with raising soybeans. Cottonseed output in 1984 could likely exceed last year's estimated 5 million tons if seed cotton production increases. Rapeseed production is expected to continue to sharply increase.

Application of mineral fertilizers on the potato crop has increased—with a 6-percent rise in 1982 and another rise likely in 1983. Thus, with continuation of the ICT method in 1984 and an expected small area increase, potato production in 1984 could exceed 1983's 83 million tons about 2 percent.

With normal weather, vegetable output in 1984 may reach the record 30.1 million tons planned. Although area and production for fruits and berries in 1983 is not known, uptrends in area and production during 1981-82 make it likely that production in 1984 will reach the plan for 18.2 million tons and probably surpass it.

Although the surface water supply is better this year in the Soviet cotton belt, chronic problems relating to shortages of irrigation-water supplies are expected to continue into 1984. Even with normal snowfall in the mountains, regional surface waters in the cotton-growing regions of Soviet Central Asia apparently are close to being fully utilized. With a more normal growing season, the 1984 target of 9.4 million tons of seed cotton is realistic. However, with a more normal ripening cycle of cotton bolls, hand-picking will be greatly reduced from 1983 and mechanical harvesting will rise, increasing the risk of lower cotton quality.

Agricultural imports in 1984 are expected to decline, possibly up to \$1 billion. Larger domestic production of grain and sustained forage production may cut grain import requirements for the calendar year. Sugar imports should continue to trend downward because of the larger 1983 sugarbeet crop. Fruit and vegetable import demand should remain close to 1982 and 1983 levels. With anticipated further gains in livestock products in 1984, imports of those products should show no more than a modest rise.

The likely improvement in world coarse grain availability following the 1984 harvest could lead to shifts in relative prices, which would make wheat imports less attractive. However, continued problems procuring quality hard and durum wheats from the Soviet crop, and the availability of feed-quality wheat at bargain prices from the EC may temper the decline in wheat's share of Soviet grain imports.

The failure of domestic oilseed output to increase in 1983 is expected to keep 1984 oilseed imports near 1983 levels. Soviet oilseed meal imports are expected to decline by more than one-fifth, partly because of improved domestic protein feed supplies and partly in response to higher foreign soybean meal prices. Higher prices for foreign vegetable oil are likely to keep vegetable oil imports from increasing beyond 1983's 708,000 tons.

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USSR AGRICULTURE TO 1990

At the beginning of the 1970's, the Soviets made a major food policy shift from a self-sufficient (even net grain exporter) posture to that of growing dependence on imports. The rapid price increases for their major exports, oil and gold, and the cooperative attitude of the world's largest grain exporter, the United States, supported the decision to rely more heavily on imports to upgrade Soviet diets. But a decade later, the political and economic milieu was less conducive to a policy of continually expanding food imports.

General Secretary Brezhnev announced the Food Program in October 1980, 9 months after the United States curtailed exports of agricultural commodities to the USSR. Details on the program were endorsed by the party leadership and released in May 1982. If there was any change under his successor Andropov, it was to further accelerate the program's implementation. Increased vertical integration within the food system and increased worker incentives are two measures being advocated to increase production. Although much of the rhetoric has been heard before, there appears to be a serious commitment to change as the Soviets continue to emphasize the local and regional APK associations, the collective contract teams, and greater accountability of industry to agriculture, and have increased government purchase prices and bonuses for agricultural goods. A suggestion by G. Rudenko (chief of APK Department, GOSPLAN) in *Pravda*, March 16, 1984, that farms purchase inputs directly from suppliers without close management by the State planning agency may be another indication of Soviet consideration of alternative avenues for increased initiative. The commitment to regaining greater self-sufficiency may have been the impetus for the 1981 revision of the per capita food consumption norms, which lowered those for meat, fish, fruits, and vegetables and raised those for grain and potatoes. The Soviets plan to maintain capital investment in the APK at high levels, now about one-third of all capital investment in the national economy. The new General Secretary Chernenko was an ardent supporter of the Food Program when it was initiated, and is expected to continue the initiative.

The Soviets may be able to hold the line and perhaps further decrease agricultural imports throughout the 1980's and into the 1990's as a result of the more modest

food consumption goals, the management and incentive changes, sustained high investments, and the continuing long-term programs of agricultural research and education. Although large year-to-year variations will continue, USSR grain imports by 1990 may decline because of increased grain production, better protein supplies, and a modest increase in feeding efficiency. The Soviets may change the makeup of grain imports from the 2:1 wheat/coarse grain ratio of the last 2 years in order to upgrade livestock feeds. Because the United States more clearly dominates the world coarse grain market, it stands to benefit from a shift to coarse grains. Two factors could hinder this shift. One is the chronic shortage of high-quality wheat, despite 80 to 100 million tons of wheat production of which one-third or more is fed. Another is that the greater number of major wheat suppliers in the world export market gives the USSR more economic and political flexibility in arranging wheat imports than in making coarse grain purchases. The Soviet Union will probably continue diversification in suppliers, seeking low minimum levels in long-term grain agreements with major exporting countries.

Trend analyses by the Economic Research Service suggest that grain production (bunker weight) in 1990 could approach 235 million tons, 15 to 20 million tons below the 12th 5-year (1986-90) plan average annual production. Besides increased domestic grain production, increases in fodders (especially hay and haylage) and oilseed production, and higher oilseed and meal imports should support meat production close to 20 million tons in 1991. This projection assumes only very minor increases in feeding efficiency. Continued declines in output of the more efficient private sector in the European USSR will largely counterbalance improvements in the mixed feed industry and industrial livestock sector. With meat imports of 800,000 tons, Soviet per capita meat consumption would be about 68 kilograms. Although this is somewhat below the 1990 plan of 70 kilograms, it would be about 15 percent higher than 1983, and about 20 percent above the 1979-82 average.

The goals of the Soviet agricultural policy are to maximize domestic agricultural output, to maintain food price stability, and to increase efficiency of resource use in agriculture, while remaining consistent with communist ideology. Thus, the Soviet Union tolerates devoting 35 percent of the State expenditures and almost as much of its capital investment funds to the APK. By Soviet estimates, subsidies within the food sector alone account for 13 percent of all State expenditures. It subsidizes inefficient producers and production in marginal resource areas and retains a large agricultural labor force still insufficient to meet agriculture's needs and also unavailable for use by other labor-short sectors in the economy. Without a major restructuring of management systems and price increases in the food distribution system, expenditures and investments must continue to increase to sustain growth in production. [Kathryn Zeimet (202) 447 8654]

FOOTNOTES

- (1) *Voprosy ekonomiki (Problems of Economics)*, no. 5 (1983).
- (2) *Zakupki sel'skokhozyaistvennykh produktov (Procurements of Agricultural Products)*, no. 6 (1983).
- (3) *Kormoproizvodstvo (Feed Production)*, no. 5 (1983).
- (4) *Ekonomika sel'skogo khozyaistva (Agricultural Economics)*, no. 5 (1983).
- (5) *Ibid.*, no. 1 (1983).
- (6) *Ibid.*, no. 5 (1983).
- (7) *Izvestiya* (November 26, 1983).
- (8) The USSR does not publish systematic national data on grain utilization. USDA estimates use based on available information from a number of sources.
- (9) *Zhivotnovodstvo (Livestock Raising)*, no. 11 (1983), and *Kormoproizvodstvo*, no. 6 (1980).
- (10) *Kormoproizvodstvo*, no. 8 (1980).
- (11) *Vestnik sel'skokhozyaistvennoi nauki (Bulletin of Agricultural Science)*, no. 10 (1981).
- (12) *Ibid.*, no. 8 (1981); *Ekonomicheskaya gazeta (Economics Gazette)*, no. 35 (1981); and *Zhivotnovodstvo*, no. 11 (1980).
- (13) *Zhivotnovodstvo*, no. 11 (1983).
- (14) *Prodovol'stvennaya programma SSSR na period do 1990 goda i mery po ee realizatsii (USSR Food Program to 1990 and Measures to Fulfill It)*, Moscow, 1982.
- (15) *Kormoproizvodstvo*, no. 7 and no. 9 (1983).
- (16) *Ibid.*, no. 9 (1983).
- (17) ICT is the Soviet term for using modern farming techniques such as careful selection of hybrid seeds, highly mechanized cultivation, and application of fertilizer and pesticides.
- (18) JPRS, USSR Report, *Agriculture*, no. 1382 (May 19, 1983), p. 86.
- (19) *Izvestiya* (September 10, 1982).
- (20) *Maslichnyye kul'tury (Oil Producing Crops)*, no. 1 (1983), p.9.
- (21) *Moscow News*, no. 31 (1983), and *Pravda* (February 18, 1983).
- (22) These trade data are prepared by USDA's East Europe-USSR Branch, which converts officially reported Soviet data (from *Vneshnyaya trgovlya v SSSR, USSR Foreign Trade*) to U.S. dollars at the officially reported average exchange rates for each year. The categories reported approximate the SITC for agricultural products (excluding natural rubber and some minor crude material categories).
- For this year's report, the branch made some definitional changes. The most important was to treat USSR grain and grain products trade according to prevailing USDA definitions. Previously, data followed the Soviet convention of defining grain as only including wheat, rye, barley, oats, and corn. Readers preferring the USSR definitions can still use them by making the appropriate adjustments. The Soviets report exports and imports on an f.o.b. basis. They also record as imports items purchased abroad, even if they actually never enter the USSR. Thus, for instance, Canadian flour purchased for delivery to Cuba appears in Soviet trade statistics as both an import and an export.
- (23) D. Gale Johnson and Karen McConnell Brooks, *Prospects for Soviet Agriculture in the 1980's* (Indiana University Press: Bloomington, 1983), p. 140.
- (24) *Izvestiya* (December 20, 1983).
- (25) *Sel'skaya zhizn'* (July 2, 1983).
- (26) *Sotsialisticheskaya industriya (Socialist Industry)* (May 24, 1983).
- (27) *Sel'skaya zhizn'* (July 19, 1983).
- (28) *Ekonomika i organizatsiya promyshlennogo proizvodstva (Economics and Organization of Industrial Production)*, no. 11 (1982), pp. 21-36.
- (29) *Ekonomika sel'skogo khozyaistva*, no. 10 (1983), p. 10.
- (30) *Ibid.*, p. 12.
- (31) *Ibid.*
- (32) Johnson and Brooks, p. 142.
- (33) *Ekonomika sel'skogo khozyaistva*, no. 10 (1983), p. 13.
- (34) *Planovoe khozyaistvo (Planned Economy)*, no. 8 (1983), p. 83.
- (35) *Vestnik sel'skokhozyaistvennoi nauki*, no. 10 (1983), p. 69.
- (36) *Ibid.*, p. 27.
- (37) *Agrokimiya (Agrochemicals)*, no. 8 (1983), p. 4.
- (38) *Khimiya v sel'skom khozyaistve (Chemistry in Agriculture)*, no. 1 (1984), p. 3.
- (39) *Ekonomika sel'skogo khozyaistva*, no. 10 (1983), p. 13.
- (40) *Ibid.*
- (41) *Finansy SSSR (USSR Finance)*, no. 7 (1983), p. 11.
- (42) *Ibid.*
- (43) *Ibid.*, p. 13.

APPENDIX
Agreement Between
The Government of the United States of America and
The Government of the Union of Soviet Socialist Republics
on the Supply of Grain

The Government of the United States of America ("USA") and the Government of the Union of Soviet Socialist Republics ("USSR"),

Recalling the "Basic Principles of Relations between the United States of America and the Union of Soviet Socialist Republics" of May 29, 1972 and other relevant agreements between them;

Desiring to strengthen long-term cooperation between the two countries on the basis of mutual benefit and equality;

Mindful of the importance which the production of food, particularly grain, has for the peoples of both countries;

Recognizing the need to stabilize trade in grain between the two countries; and

Affirming their conviction that cooperation in the field of trade will contribute to overall improvement of relations between the two countries;

Have agreed as follows:

Article I

The Government of the USA and the Government of the USSR hereby enter into an agreement for the purchase and sale of wheat and corn for supply to the USSR. To this end, during the period that this Agreement is in force, except as otherwise agreed by the Parties, the Soviet foreign trade organizations shall purchase from private commercial sources, for shipment in each twelve-month period beginning October 1, 1983, nine million metric tons of wheat and corn grown in the USA; in doing so, the Soviet foreign trade organizations, if interested, may purchase, on account of the said quantity, soybeans and/or soybean meal produced in the USA, in the proportion of one ton of soybeans and/or soybean meal for two tons of grain. In any case, the minimum annual quantities of wheat and corn shall be no less than four million metric tons each.

The Soviet foreign trade organizations may increase the nine million metric ton quantity mentioned above without consultations by as much as three million metric tons of wheat and/or corn for shipment in each twelve-month period beginning October 1, 1983.

The Government of the USA shall employ its good offices to facilitate and encourage such sales by private commercial sources. Purchases/sales of commodities under this Agreement will be made at the market price prevailing for these products at the time of purchase/sale and in accordance with normal commercial terms.

Article II

During the term of this Agreement, except as otherwise agreed by the Parties, the Government of the USA shall not exercise any discretionary authority available to it under United States law to control exports of commodities purchased for supply to the USSR in accordance with Article I.

Article III

In carrying out their obligations under this Agreement, the Soviet foreign trade organizations shall endeavor to space their purchases in the USA and shipments to the USSR as evenly as possible over each twelve-month period.

Article IV

The Government of the USSR shall assure that, except as the Parties may otherwise agree, all commodities grown in the USA and purchased by Soviet foreign trade organizations under this Agreement shall be supplied for consumption in the USSR.

Article V

Whenever the Government of the USSR wishes the Soviet foreign trade organizations to be able to purchase more wheat or corn grown in the USA than the amounts specified in Article I, it shall notify the Government of the USA.

Whenever the Government of the USA wishes private commercial sources to be able to sell to the USSR more wheat or corn grown in the USA than the amounts specified in Article I, it shall notify the Government of the USSR.

In both instances, the Parties will consult as soon as possible in order to reach agreement on possible quantities of grain to be supplied to the USSR prior to purchase/sale or conclusion of contracts for the purchase/sale of grain in amounts above those specified in Article I.

Article VI

The Government of the USA is prepared to use its good offices, as appropriate and within the laws in force in the USA, to be of assistance on questions of the appropriate quality of the grain to be supplied from the USA to the USSR.

Article VII

It is understood that the shipment of commodities from the USA to the USSR under this Agreement shall be in accord with the provisions of the American-Soviet Agreement on Maritime Matters which is in force during the period of shipments hereunder.

Article VIII

The Parties shall hold consultations concerning the implementation of this Agreement and related matters at intervals of six months, and at any other time at the request of either Party.

Article IX

This Agreement shall enter into force on execution and shall remain in force until September 30, 1988, unless extended by the Parties for a mutually agreed period.

DONE at Moscow this twenty-fifth day of August, 1983, in duplicate, each in the English and Russian languages, both texts being equally authentic.

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Table 1 —Area, yield, and production of grain, USSR, 5-year averages and 1976-83 annual

| Year | Wheat | | | Rye | Barley | Oats | Corn | Other ¹ | Total grain |
|-------------------------|--------|--------|---------|--------|--------|--------|--------|--------------------|-------------|
| | Winter | Spring | Total | | | | | | |
| 1,000 hectares | | | | | | | | | |
| Area | | | | | | | | | |
| 1966-70 average | 18,280 | 48,894 | 67,174 | 11,505 | 20,331 | 8,680 | 3,517 | 10,876 | 122,083 |
| 1971-75 average | 18,443 | 43,025 | 61,469 | 8,500 | 28,370 | 11,310 | 3,596 | 10,743 | 123,988 |
| 1976 | 17,248 | 42,219 | 59,467 | 9,035 | 34,261 | 11,269 | 3,303 | 10,425 | 127,760 |
| 1977 | 20,712 | 41,318 | 62,030 | 6,697 | 34,514 | 13,026 | 3,362 | 10,715 | 130,344 |
| 1978 | 23,122 | 39,776 | 62,898 | 7,719 | 32,690 | 12,097 | 2,535 | 10,526 | 128,465 |
| 1979 | 18,718 | 38,964 | 57,682 | 6,476 | 37,005 | 12,239 | 2,667 | 10,282 | 126,351 |
| 1980 | 22,553 | 38,922 | 61,475 | 8,645 | 31,583 | 11,770 | 2,977 | 10,158 | 126,608 |
| 1976-80 average | 20,471 | 40,240 | 60,710 | 7,714 | 34,011 | 12,080 | 2,969 | 10,421 | 127,906 |
| 1981 | 20,305 | 38,927 | 59,232 | 7,551 | 31,781 | 12,470 | 3,545 | 10,980 | 125,559 |
| 1982 | 20,438 | 36,840 | 57,278 | 9,829 | 29,706 | 11,489 | 4,161 | 10,549 | 123,012 |
| 1983 ² | 16,900 | 33,500 | 50,400 | 10,200 | 31,600 | 12,500 | 5,200 | 11,600 | 121,500 |
| Metric tons per hectare | | | | | | | | | |
| Yield | | | | | | | | | |
| 1966-70 average | 1.96 | 1.11 | 1.34 | 1.12 | 1.50 | 1.38 | 2.72 | 1.18 | 1.37 |
| 1971-75 average | 2.26 | 1.10 | 1.45 | 1.35 | 1.53 | 1.31 | 2.84 | 1.19 | 1.47 |
| 1976 | 2.59 | 1.24 | 1.63 | 1.55 | 2.03 | 1.61 | 3.06 | 1.45 | 1.75 |
| 1977 | 2.51 | .97 | 1.49 | 1.27 | 1.53 | 1.41 | 3.25 | 1.21 | 1.50 |
| 1978 | 2.98 | 1.31 | 1.92 | 1.76 | 1.90 | 1.54 | 3.50 | 1.26 | 1.85 |
| 1979 | 2.05 | 1.33 | 1.56 | 1.25 | 1.30 | 1.24 | 3.13 | .91 | 1.42 |
| 1980 | 2.21 | 1.24 | 1.60 | 1.18 | 1.38 | 1.32 | 3.17 | 1.21 | 1.49 |
| 1976-80 average | 2.48 | 1.22 | 1.64 | 1.41 | 1.63 | 1.42 | 3.22 | 1.21 | 1.60 |
| 1981 ³ | 1.97 | 1.03 | 1.35 | 1.26 | 1.18 | 1.20 | 2.26 | .91 | 1.27 |
| 1982 ³ | 2.30 | 1.06 | 1.50 | 1.42 | 1.38 | 1.35 | 3.24 | .95 | 1.46 |
| 1983 ³ | 2.22 | 1.21 | 1.55 | 1.43 | 1.72 | 1.40 | 3.12 | 1.22 | 1.60 |
| 1,000 metric tons | | | | | | | | | |
| Production | | | | | | | | | |
| 1966-70 average | 35,888 | 54,304 | 90,192 | 12,834 | 30,454 | 11,938 | 9,558 | 12,585 | 167,562 |
| 1971-75 average | 41,590 | 47,345 | 88,935 | 11,493 | 43,289 | 14,812 | 10,215 | 12,810 | 181,554 |
| 1976 | 44,594 | 52,288 | 96,882 | 13,991 | 69,539 | 18,113 | 10,138 | 15,092 | 223,755 |
| 1977 | 51,971 | 40,190 | 92,161 | 8,480 | 52,687 | 18,407 | 10,979 | 13,013 | 195,727 |
| 1978 | 68,829 | 52,107 | 120,936 | 13,612 | 62,118 | 18,578 | 8,898 | 13,248 | 237,390 |
| 1979 | 38,417 | 51,790 | 90,207 | 8,113 | 47,954 | 15,162 | 8,373 | 9,367 | 179,176 |
| 1980 | 49,816 | 48,366 | 98,182 | 10,205 | 43,450 | 15,544 | 9,454 | 12,255 | 189,090 |
| 1976-80 average | 50,725 | 48,948 | 99,674 | 10,880 | 55,150 | 17,161 | 9,568 | 12,595 | 205,028 |
| 1981 ³ | 40,000 | 40,000 | 80,000 | 9,500 | 37,500 | 15,000 | 8,000 | 10,000 | 160,000 |
| 1982 ³ | 47,000 | 39,000 | 86,000 | 14,000 | 41,000 | 15,500 | 13,500 | 10,000 | 180,000 |
| 1983 ³ | 37,500 | 40,500 | 78,000 | 14,600 | 54,500 | 17,500 | 16,200 | 14,200 | 195,000 |

¹Includes millet, buckwheat, rice, pulses, and miscellaneous grains. ²Preliminary. ³USDA Estimate.

Table 2—Total supply and estimated utilization of grain, USSR, 1976/77-1983/84¹

| Year beginning July 1 | Produc- tion ² | Trade | | | Avail- ability | Utilization | | | | | | Stock change ³ |
|-----------------------------|------------------------------|---------|---------|-------|-------------------|-------------|-----------------|------|-------------------|------|-------|------------------------------|
| | | Imports | Exports | Net | | Seed | Indus- trial | Food | Dockage- waste | Feed | Total | |
| Million metric tons | | | | | | | | | | | | |
| Total grains ⁴ | | | | | | | | | | | | |
| 1976/77 | 223.8 | 11.0 | 3.3 | +7.7 | 232 | 29 | 4 | 45 | 31 | 112 | 221 | +11 |
| 1977/78 | 195.7 | 18.9 | 2.3 | +16.6 | 212 | 28 | 4 | 45 | 29 | 122 | 228 | -16 |
| 1978/79 | 237.4 | 15.6 | 2.8 | +12.8 | 250 | 28 | 4 | 46 | 28 | 125 | 231 | +19 |
| 1979/80 | 179.2 | 31.0 | 0.8 | +30.2 | 209 | 28 | 4 | 46 | 22 | 123 | 223 | -14 |
| 1980/81 | 189.1 | 34.8 | 0.5 | +34.3 | 223 | 27 | 4 | 47 | 28 | 119 | 225 | -2 |
| 1981/82 | 160.0 | 46.0 | 0.5 | +45.5 | 206 | 27 | 4 | 47 | 16 | 116 | 210 | -4 |
| 1982/83 | 180.0 | 32.5 | 0.5 | +32.0 | 212 | 27 | 4 | 47 | 18 | 117 | 213 | -1 |
| 1983/84 ⁵ | 195.0 | 31.0 | 0.5 | +30.5 | 225 | 27 | 4 | 47 | 21 | 123 | 222 | +3 |
| Wheat | | | | | | | | | | | | |
| 1976/77 | 96.9 | 4.6 | 1.0 | +3.6 | 100 | 15 | 1 | 35 | 14 | 28 | 93 | +7 |
| 1977/78 | 92.2 | 6.6 | 1.0 | +5.6 | 98 | 15 | 1 | 35 | 14 | 44 | 109 | -11 |
| 1978/79 | 120.8 | 5.1 | 1.5 | +3.6 | 124 | 14 | 1 | 35 | 14 | 43 | 107 | +17 |
| 1979/80 | 90.2 | 12.0 | 0.5 | +11.5 | 102 | 15 | 1 | 35 | 11 | 53 | 115 | -13 |
| 1980/81 | 98.1 | 16.0 | 0.5 | +15.5 | 114 | 15 | 1 | 36 | 15 | 48 | 115 | -1 |
| 1981/82 | 80.0 | 19.5 | 0.5 | +19.0 | 99 | 15 | 1 | 36 | 8 | 42 | 102 | -3 |
| 1982/83 | 86.0 | 20.2 | 0.5 | +19.7 | 106 | 15 | 1 | 36 | 9 | 45 | 106 | 0 |
| 1983/84 ⁵ | 78.0 | 20.0 | 0.5 | +19.5 | 97 | 15 | 1 | 36 | 9 | 33 | 94 | +3 |
| Coarse grains ⁶ | | | | | | | | | | | | |
| 1976/77 | 115.0 | 5.7 | 2.0 | +3.7 | 119 | 12 | 3 | 7 | 16 | 78 | 116 | +3 |
| 1977/78 | 92.6 | 11.7 | 1.0 | +10.7 | 103 | 11 | 3 | 7 | 14 | 74 | 109 | -6 |
| 1978/79 | 105.0 | 10.0 | 1.0 | +9.0 | 114 | 12 | 3 | 7 | 13 | 79 | 114 | 0 |
| 1979/80 | 81.0 | 18.4 | 0 | +18.4 | 99 | 12 | 3 | 7 | 10 | 68 | 100 | -1 |
| 1980/81 | 81.0 | 18.0 | 0 | +18.0 | 99 | 11 | 3 | 7 | 12 | 67 | 100 | -1 |
| 1981/82 | 72.0 | 25.5 | 0 | +25.5 | 98 | 11 | 3 | 7 | 7 | 71 | 99 | -1 |
| 1982/83 | 86.0 | 11.3 | 0 | +11.3 | 97 | 11 | 3 | 7 | 9 | 68 | 98 | -1 |
| 1983/84 ⁵ | 105.0 | 10.0 | 0 | +10.0 | 115 | 11 | 3 | 7 | 11 | 83 | 115 | 0 |

¹All are USDA estimates except production 1976/77-1980/81. Rounded to the nearest million tons, except for production and trade data. Totals may not add due to rounding. ²Calendar year basis. ³Difference between availability and estimated total utilization. ⁴Includes wheat, coarse grains, buckwheat, rice, pulses, and miscellaneous grain. ⁵Estimated/projected. ⁶Includes rye, barley, oats, corn, and millet.

Table 3—January 1 livestock numbers and animal units in terms of cows, USSR, 1971-84

| Year | Cattle | | Hogs | Sheep | Goats | Horses | Poultry | Total animal units ² |
|--------------|--------|-------------------|------|--------------------|------------------|------------------|----------------------|---------------------------------------|
| | Total | Cows ¹ | | | | | | |
| Million head | | | | | | | | |
| 1971 | 99.2 | 39.8 | 67.5 | 138.0 | 5.4 | 7.4 | 652.7 | 130.5 |
| 1972 | 102.4 | 40.0 | 71.4 | 139.9 | 5.4 | 7.3 | 686.5 | 134.4 |
| 1973 | 104.0 | 40.6 | 66.6 | 139.1 | 5.6 | 7.1 | 700.0 | 134.1 |
| 1974 | 106.3 | 41.4 | 70.0 | 142.6 | 5.9 | 6.8 | 747.7 | 138.0 |
| 1975 | 109.1 | 41.9 | 72.3 | 145.3 | 5.9 | 6.8 | 792.4 | 141.6 |
| 1976 | 111.0 | 41.9 | 57.9 | 141.4 | 5.7 | 6.4 | 734.4 | 136.5 |
| 1977 | 110.3 | 42.0 | 63.1 | 139.8 | 5.5 | 6.0 | 796.0 | 138.4 |
| 1978 | 112.7 | 42.6 | 70.5 | 141.0 | 5.6 | 5.8 | 882.3 | 143.9 |
| 1979 | 114.1 | 43.0 | 73.5 | 142.6 | 5.5 | 5.7 | 946.9 | 147.0 |
| 1980 | 115.1 | 43.3 | 73.9 | 143.6 | 5.8 | 5.6 | 980.9 | 148.7 |
| 1981 | 115.1 | 43.4 | 73.4 | 141.6 | 5.9 | 5.6 | 1,029.3 | 149.4 |
| 1982 | 115.9 | 43.7 | 73.3 | 142.4 | 6.1 | 5.6 | 1,067.5 | 150.8 |
| 1983 | 117.2 | 43.8 | 76.7 | 142.2 | 6.3 | 5.6 | 1,104.5 | 153.4 |
| 1984 | 119.4 | 43.8 | 78.5 | ³ 145.0 | ³ 6.4 | ³ 5.6 | ³ 1,125.0 | 156.0 |

¹Revised series beginning 1966; excludes cows placed on feed for slaughter. ²In terms of cows. Conversion ratios as follows: Cattle (other than cows) .6; hogs .3; total sheep and goats .1; horses 1.0; and poultry .02. ³Estimate.

Table 4—USSR livestock and poultry numbers on State and collective farms by first of month, for selected years

| Year and category | Jan. | Feb. | Mar | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <i>Million head</i> | | | | | | | | | | | | |
| Cattle | | | | | | | | | | | | |
| 1975 | 80.9 | 81.0 | 82.2 | 83.9 | 86.0 | 87.0 | 86.5 | 86.6 | 85.8 | 84.6 | 83.9 | 83.4 |
| 1980 | 89.0 | 88.9 | 89.6 | 91.6 | 93.4 | 94.0 | 93.5 | 93.1 | 92.2 | 90.8 | 90.0 | 89.6 |
| 1981 | NA | 89.4 | 90.0 | 92.2 | 94.1 | 94.8 | 94.3 | 93.8 | 92.7 | 91.1 | 90.3 | 90.1 |
| 1982 | NA | 90.1 | 90.6 | 92.6 | 94.5 | 95.4 | 94.9 | 94.6 | 93.6 | 91.9 | 91.0 | 90.5 |
| 1983 | NA | 90.6 | 91.6 | 93.8 | 95.9 | 96.8 | 96.4 | 96.0 | 95.1 | 93.7 | 93.1 | 92.8 |
| Cows | | | | | | | | | | | | |
| 1975 | 26.9 | 26.8 | 26.8 | 27.0 | 27.2 | 27.4 | 27.5 | 27.5 | 27.4 | 27.3 | 27.3 | 27.3 |
| 1980 | 29.8 | 29.5 | 29.5 | 29.6 | 29.7 | 29.8 | 29.9 | 29.9 | 29.8 | 29.7 | 29.6 | 29.6 |
| 1981 | NA | 29.6 | 29.6 | 29.7 | 29.8 | 29.9 | 30.0 | 29.9 | 29.8 | 29.8 | 29.7 | 29.7 |
| 1982 | NA | 29.7 | 29.7 | 29.8 | 29.9 | 30.0 | 30.1 | 30.0 | 30.0 | 29.9 | 29.7 | 29.7 |
| 1983 | NA | 29.7 | 29.6 | 29.7 | 29.9 | 29.9 | 30.0 | 29.9 | 29.9 | 29.8 | 29.7 | 29.7 |
| Hogs | | | | | | | | | | | | |
| 1975 | 53.6 | 53.5 | 53.2 | 52.3 | 53.6 | 55.2 | 55.6 | 56.8 | 54.3 | 49.6 | 46.4 | 43.9 |
| 1980 | 55.2 | 54.9 | 54.3 | 54.4 | 55.0 | 55.6 | 56.0 | 58.0 | 58.2 | 58.2 | 57.7 | 56.6 |
| 1981 | NA | 55.4 | 55.2 | 55.2 | 55.6 | 56.3 | 56.9 | 58.3 | 58.6 | 58.6 | 58.4 | 56.2 |
| 1982 | NA | 54.8 | 54.6 | 54.1 | 55.0 | 55.8 | 56.6 | 58.2 | 59.1 | 59.1 | 58.6 | 57.4 |
| 1983 | NA | 56.6 | 56.8 | 56.8 | 57.4 | 58.6 | 59.3 | 61.0 | 61.8 | 61.5 | 60.8 | 59.4 |
| Poultry | | | | | | | | | | | | |
| 1975 | 401.8 | 404.9 | 444.3 | 498.8 | 547.4 | 577.2 | 573.3 | 547.3 | 483.5 | 418.8 | 376.2 | 361.8 |
| 1980 | 592.0 | 586.0 | 606.0 | 642.8 | 688.0 | 708.9 | 704.0 | 707.6 | 697.8 | 675.0 | 655.5 | 634.8 |
| 1981 | NA | 624.1 | 651.3 | 689.7 | 730.6 | 741.8 | 735.7 | 733.7 | 720.9 | 691.3 | 674.2 | 659.2 |
| 1982 | NA | 651.0 | 669.8 | 706.9 | 746.8 | 757.7 | 751.1 | 756.0 | 747.0 | 726.0 | 713.0 | 695.0 |
| 1983 | NA | 687.0 | 704.0 | 733.3 | 768.3 | 778.8 | 766.2 | 777.0 | 764.2 | 743.4 | 728.5 | 709.7 |
| Sheep and goats | | | | | | | | | | | | |
| 1975 | 116.8 | 119.6 | 125.3 | 136.1 | 149.6 | 151.7 | 146.8 | 142.2 | 135.4 | 127.4 | 120.7 | 116.5 |
| 1980 | 117.4 | 119.8 | 126.5 | 137.8 | 148.4 | 148.8 | 143.9 | 140.2 | 133.8 | 125.3 | 119.5 | 116.7 |
| 1981 | NA | 117.7 | 124.4 | 135.9 | 148.2 | 148.5 | 143.9 | 140.0 | 133.6 | 124.9 | 119.6 | 116.6 |
| 1982 | NA | 117.8 | 124.0 | 135.1 | 146.5 | 146.4 | 141.5 | 137.6 | 131.1 | 122.6 | 118.0 | 115.4 |
| 1983 | NA | 117.3 | 123.0 | 133.9 | 147.7 | 148.2 | 143.7 | 140.0 | 133.3 | 125.0 | 120.2 | 117.5 |

NA = Not available.

Table 5—Production of principal livestock products, USSR, 5-year averages and 1976-83 annual

| Year | Meat ¹ | | | | | | Milk | Wool ² | Eggs |
|------------------------------|---------------------|--------------------|--------------------|------------------------|--------------------|------------------|---------------------|-------------------|---------------------|
| | Total | Beef and veal | Pork | Mutton, lamb, and goat | Poultry | Other | | | |
| 1,000 metric tons | | | | | | | | | |
| 1966-70 average | 11,583 | 5,187 | 4,327 | 992 | 853 | 224 | 80,553 | 398 | 35,840 |
| 1971-75 average | 14,004 | 5,985 | 5,394 | 972 | 1,335 | 318 | 87,446 | 442 | 51,427 |
| 1976 | 13,583 | 6,615 | 4,343 | 885 | 1,411 | 329 | 89,675 | 436 | 56,187 |
| 1977 | 14,722 | 6,888 | 4,950 | 894 | 1,691 | 299 | 94,929 | 459 | 61,194 |
| 1978 | 15,501 | 7,086 | 5,302 | 921 | 1,902 | 290 | 94,677 | 467 | 64,517 |
| 1979 | 15,341 | 6,903 | 5,268 | 863 | 2,034 | 273 | 93,130 | 472 | 65,585 |
| 1980 | 15,073 | 6,645 | 5,183 | 849 | 2,139 | 257 | 90,899 | 461 | 67,943 |
| 1976-80 average ³ | 14,840 | 6,827 | 5,009 | 882 | 1,835 | 290 | 92,662 | 459 | 63,133 |
| 1981 | 15,200 | 6,627 | 5,220 | 846 | 2,255 | 253 | 88,874 | ⁴ 479 | 70,855 |
| 1982 | 15,362 | 6,618 | 5,265 | 816 | 2,425 | 238 | 91,044 | ⁴ 471 | 72,409 |
| 1983 | ⁵ 16,000 | ⁴ 6,800 | ⁴ 5,550 | ⁴ 850 | ⁴ 2,600 | ⁴ 200 | ⁵ 96,400 | ⁴ 473 | ⁵ 74,700 |

¹Carcass weight, including fat. ²Greasy basis. ³Revision based on the average published in *Narodnoe khozyaistvo SSSR 1982*. Is not consistent with average derived from last published figures for each year. ⁴Estimate. ⁵Preliminary.

Table 6—USSR consumption norms of selected food products and per capita consumption, selected years 1950-82 and 1990 plan

| Year | Meat and fat | Fish and fish products | Milk and milk products ¹ | Eggs ² | Sugar | Vegetable oil | Potatoes | Grain ³ | Vegetables and melons | Fruit and berries |
|-------------------------------|--------------|------------------------|-------------------------------------|-------------------|-------|---------------|----------|--------------------|-----------------------|-------------------|
| Kilograms | | | | | | | | | | |
| 1950 | 26 | 7.0 | 172 | 60 | 11.6 | 2.7 | 241 | 172 | 51 | 11 |
| 1960 | 40 | 9.9 | 240 | 118 | 28.0 | 5.3 | 143 | 164 | 70 | 22 |
| 1970 | 48 | 15.4 | 307 | 159 | 38.8 | 6.8 | 130 | 149 | 82 | 35 |
| 1966-70 average | 47 | 14.3 | 287 | 144 | 37.2 | 6.5 | 132 | 150 | 78 | NA |
| 1971 | 50 | 14.8 | 300 | 174 | 39.5 | 7.0 | 128 | 147 | 85 | 39 |
| 1972 | 52 | 15.1 | 296 | 185 | 38.8 | 7.0 | 121 | 145 | 80 | 36 |
| 1973 | 53 | 16.1 | 307 | 195 | 40.8 | 7.3 | 122 | 143 | 85 | 41 |
| 1974 | 55 | 16.5 | 316 | 205 | 41.0 | 7.9 | 121 | 142 | 87 | 37 |
| 1975 | 57 | 16.8 | 315 | 216 | 40.9 | 7.6 | 120 | 141 | 89 | 39 |
| 1971-75 average | 53 | 15.9 | 307 | 195 | 40.2 | 7.4 | 122 | 144 | 85 | 38 |
| 1976 | 56 | 18.4 | 316 | 209 | 41.9 | 7.7 | 119 | 141 | 86 | 39 |
| 1977 | 56 | 17.1 | 321 | 222 | 42.4 | 8.1 | 120 | 139 | 88 | 41 |
| 1978 | 57 | 17.1 | 318 | 232 | 42.8 | 8.3 | 117 | 140 | 92 | 41 |
| 1979 | 58 | 16.3 | 319 | 235 | 42.0 | 8.4 | 115 | 138 | 98 | 38 |
| 1980 | 58 | 17.6 | 314 | 239 | 44.4 | 8.8 | 109 | 138 | 97 | 38 |
| 1976-80 average | 57 | 17.3 | 318 | 227 | 42.7 | 8.3 | 116 | 139 | 92 | 39 |
| 1981 | 57 | 18.0 | 304 | 247 | 44.5 | 9.1 | 104 | 137 | 99 | 40 |
| 1982 | 57 | 18.4 | 295 | 249 | 44.5 | 9.3 | 110 | 137 | 101 | 42 |
| 1990 plan | 70 | 19.0 | 330-340 | 260-266 | 45.5 | 13.2 | 110 | 135 | 126-135 | 66-70 |
| Consumption norm ⁴ | 78 | 18.2 | 405 | 292 | 40.0 | 9.1 | 110 | 115 | 130 | 91 |

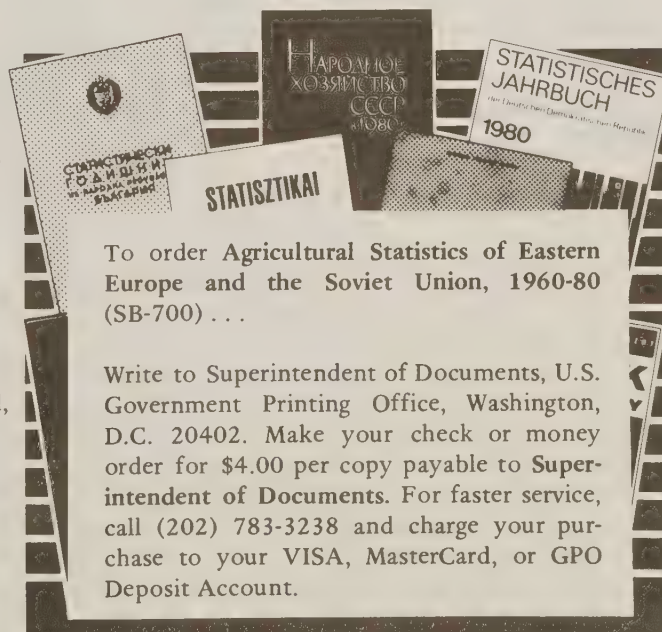
NA = Not available.

¹Including milk equivalent of butter. ²Number. ³Flour equivalent. ⁴*Planovoe khozyaistvo*, no. 10 (1981), p. 117.

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Table 7—Area, yield, and production of selected crops, USSR, 5-year averages and 1976-83 annual

| Year | Seed-cotton | Sugar-beets | Sun-flowers | Fiber flax | Potatoes | Vegetables | Fruit, berries, grapes ¹ | Tobacco ² |
|--------------------------------|-------------|-------------|--------------------|------------------|----------|------------|-------------------------------------|----------------------|
| <i>1,000 hectares</i> | | | | | | | | |
| Area | | | | | | | | |
| 1966-70 average | 2,527 | 3,582 | 4,837 | 1,341 | 8,238 | 1,440 | 2,625 | 144 |
| 1971-75 average | 2,810 | 3,527 | 4,474 | 1,234 | 7,953 | 1,601 | 3,304 | 168 |
| 1976 | 2,949 | 3,754 | 4,534 | 1,214 | 7,087 | 1,562 | 3,356 | 183 |
| 1977 | 2,992 | 3,761 | 4,574 | 1,209 | 7,067 | 1,567 | 3,370 | 182 |
| 1978 | 3,038 | 3,763 | 4,558 | 1,197 | 7,042 | 1,646 | 3,345 | 166 |
| 1979 | 3,090 | 3,739 | 4,334 | 1,046 | 6,966 | 1,654 | 3,326 | 170 |
| 1980 | 3,147 | 3,710 | 4,353 | 1,116 | 6,936 | 1,715 | 3,297 | 169 |
| 1976-80 average | 3,043 | 3,745 | 4,471 | 1,156 | 7,020 | 1,629 | 3,339 | 174 |
| 1981 | 3,168 | 3,633 | 4,235 | 946 | 6,854 | 1,703 | 3,313 | 167 |
| 1982 | 3,188 | 3,526 | 4,250 | 1,014 | 6,856 | 1,719 | 3,341 | 180 |
| 1983 ³ | 3,189 | 3,515 | 4,305 | 1,067 | 6,886 | 1,792 | ⁴ 3,350 | NA |
| <i>Metric tons per hectare</i> | | | | | | | | |
| Yield ⁵ | | | | | | | | |
| 1966-70 average | 2.41 | 22.8 | 1.32 | .34 | 11.5 | 13.2 | 3.7 | 1.44 |
| 1971-75 average | 2.73 | 21.7 | 1.32 | .37 | 11.3 | 13.7 | 3.8 | 1.62 |
| 1976 | 2.81 | 26.6 | 1.16 | .42 | 12.0 | 15.2 | 4.5 | 1.66 |
| 1977 | 2.93 | 24.8 | 1.28 | .40 | 11.8 | 14.6 | 4.5 | 1.66 |
| 1978 | 2.80 | 24.8 | 1.17 | .31 | 12.2 | 16.1 | 4.3 | 1.66 |
| 1979 | 2.96 | 20.4 | 1.24 | .30 | 13.0 | 15.6 | 4.9 | 1.74 |
| 1980 | 3.17 | 21.8 | 1.06 | .26 | 9.6 | 14.7 | 4.4 | 1.70 |
| 1976-80 average | 2.93 | 23.6 | 1.19 | .34 | 11.8 | 15.2 | 4.5 | 1.68 |
| 1981 | 3.04 | 16.8 | 1.10 | .28 | 10.5 | 15.0 | 5.0 | 1.60 |
| 1982 | 2.91 | 20.3 | 1.25 | .41 | 11.4 | 16.5 | 5.3 | 1.69 |
| 1983 ³ | 2.89 | 23.3 | 1.23 | ⁴ .42 | 12.1 | 16.2 | ⁴ 5.5 | NA |
| <i>1,000 metric tons</i> | | | | | | | | |
| Production | | | | | | | | |
| 1966-70 average | 6,099 | 81,118 | 6,389 | 458 | 94,813 | 19,472 | 9,710 | 207 |
| 1971-75 average | 7,667 | 75,984 | 5,974 | 456 | 89,782 | 22,974 | 12,393 | 273 |
| 1976 | 8,278 | 99,872 | 5,277 | 509 | 85,102 | 24,991 | 15,260 | 303 |
| 1977 | 8,758 | 93,099 | 5,904 | 480 | 83,652 | 24,149 | 15,275 | 302 |
| 1978 | 8,500 | 93,488 | 5,333 | 376 | 86,124 | 27,902 | 14,374 | 274 |
| 1979 | 9,161 | 76,214 | 5,414 | 314 | 90,956 | 27,215 | 16,303 | 296 |
| 1980 | 9,962 | 80,987 | 4,618 | 284 | 67,023 | 27,310 | 14,673 | 284 |
| 1976-80 average | 8,932 | 88,732 | 5,309 | 393 | 82,571 | 26,313 | 15,177 | 292 |
| 1981 | 9,636 | 60,844 | 4,678 | 263 | 72,139 | 27,099 | 17,287 | 268 |
| 1982 | 9,284 | 71,468 | 5,341 | 415 | 78,185 | 29,993 | 18,372 | 304 |
| 1983 ³ | 9,200 | 82,000 | ⁴ 5,300 | ⁴ 450 | 83,000 | 29,000 | ⁴ 18,500 | 377 |

NA = Not available. ¹Bearing area. ²Excluding makhorka. ³Preliminary. ⁴Estimate. ⁵Soviet reported yields vary from calculated yields in some instances.

Table 8—Government procurements of selected crops, USSR, 5-year averages and 1976-83 annual

| Year | Seed cotton | Sugar- beets | Sunflower- seeds | Fiber flax | Potatoes | Vegetables | Fruit, berries, grapes | Tobacco ¹ |
|------------------------------|--------------------|---------------------|---------------------|------------------|----------|---------------------|------------------------------|----------------------|
| <i>1,000 metric tons</i> | | | | | | | | |
| 1966-70 average | 6,099 | 74,426 | 4,672 | 421 | 10,921 | 9,416 | 5,431 | 206 |
| 1971-75 average | 7,667 | 67,907 | 4,547 | 433 | 12,732 | 13,073 | 7,189 | 271 |
| 1976 | 8,278 | 85,142 | 3,770 | 483 | 13,435 | 16,022 | 9,684 | 299 |
| 1977 | 8,758 | 84,869 | 4,447 | 440 | 17,122 | 16,171 | 9,439 | 300 |
| 1978 | 8,500 | 80,161 | 4,028 | 332 | 14,951 | 18,374 | 9,268 | 273 |
| 1979 | 9,161 | 69,300 | 4,225 | 296 | 16,400 | 18,010 | 10,882 | 294 |
| 1980 | 9,962 | 65,172 | 3,370 | 260 | 11,107 | 17,504 | 10,046 | 284 |
| 1976-80 average ² | 8,932 | 76,910 | 3,968 | 362 | 14,600 | 17,213 | 9,863 | 290 |
| 1981 | 9,636 | 53,497 | 3,649 | 252 | 13,508 | 17,096 | 11,742 | 268 |
| 1982 | 9,284 | 64,148 | 4,177 | 396 | 15,680 | 19,440 | 12,394 | 302 |
| 1983 | ³ 9,200 | ⁴ 78,000 | NA | ³ 457 | NA | ³ 19,500 | NA | 375 |

NA = Not available.

¹Excluding makhorka. ²Revised based on the average published in *Narodnoe khozyaistvo SSSR 1982*. Is not consistent with average derived from last published figures for each year. ³Preliminary. ⁴Estimate.**Table 9—USSR sugar production and trade, 5-year averages and 1976-83 annual**

| Year | Industrial production | | Imports | | | Exports refined |
|-------------------|-----------------------|---------------------|--------------------|--------------------|--------------------|------------------|
| | Total | Of which from beets | Raw | | Refined | |
| | | | Total | From Cuba | | |
| 1,000 metric tons | | | | | | |
| 1966-70 average | 10,203 | 8,638 | 2,082 | 2,081 | 2 | 1,097 |
| 1971-75 average | 9,694 | 7,771 | 2,154 | 1,812 | 82 | 249 |
| 1976 | 9,249 | 6,162 | 3,343 | 3,068 | 383 | 73 |
| 1977 | 12,036 | 8,173 | 4,287 | 3,652 | 458 | 81 |
| 1978 | 12,209 | 8,605 | 3,990 | 3,797 | 3 | 162 |
| 1979 | 10,647 | 7,293 | 3,766 | 3,707 | 294 | 226 |
| 1980 | 10,127 | 6,617 | 3,839 | 2,647 | 1,056 | 152 |
| 1976-80 average | 10,854 | 7,370 | 3,845 | 3,374 | 439 | 139 |
| 1981 | 9,491 | 5,900 | 4,190 | 3,090 | 963 | 169 |
| 1982 | 12,100 | 6,800 | 6,161 | 4,224 | 1,115 | 247 |
| 1983 | ¹ 12,400 | ² 7,800 | ² 4,800 | ² 3,000 | ² 1,000 | ² 285 |

¹Preliminary. ²Estimate.

Table 10—USSR agricultural imports, 1975-82, by value

| Commodity | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|
| <i>Million dollars¹</i> | | | | | | | | |
| Wheat | 1,617.6 | 1,110.5 | 898.5 | 1,018.7 | 1,525.0 | 2,877.5 | 3,464.0 | 3,911.1 |
| Barley | 167.4 | 353.8 | 6.0 | 61.6 | 176.1 | 364.1 | 716.7 | 350.9 |
| Corn | 858.3 | 1,458.3 | 467.4 | 1,327.6 | 1,685.4 | 1,501.5 | 2,391.9 | 1,503.1 |
| Other grain | 29.9 | 45.7 | 5.3 | 9.0 | 39.2 | 147.8 | 120.2 | 55.8 |
| Sorghum | — | — | — | — | — | 223.3 | 562.8 | 299.3 |
| Wheat flour | 92.6 | 88.1 | 102.6 | 66.0 | 172.5 | 296.9 | 559.9 | 256.9 |
| Rice, milled | 101.1 | 102.3 | 129.6 | 153.3 | 216.7 | 263.8 | 550.5 | 343.8 |
| Subtotal | 2,866.9 | 3,158.6 | 1,609.3 | 2,636.2 | 3,815.0 | 5,674.9 | 8,366.2 | 6,720.9 |
| Animals for slaughter | 190.0 | 101.1 | 115.8 | 76.5 | 134.7 | 152.6 | 176.3 | 182.9 |
| Breeding animals | 7.9 | 5.9 | 6.3 | 7.0 | 15.9 | 5.8 | 5.2 | 7.6 |
| Meat and meat products | 495.0 | 379.7 | 691.7 | 257.7 | 844.3 | 1,359.3 | 1,647.1 | 1,430.0 |
| Milk and milk products | 31.6 | 33.8 | 42.2 | 35.0 | 50.2 | 100.0 | 143.3 | 153.6 |
| Egg and egg products | 34.8 | 29.5 | 87.6 | 32.3 | 42.8 | 40.6 | 28.8 | 29.1 |
| Vegetables and potatoes | 250.8 | 274.4 | 362.7 | 391.4 | 446.5 | 456.7 | 473.0 | 447.5 |
| Fruit and berries, fresh | 245.6 | 264.0 | 262.0 | 300.6 | 370.1 | 433.6 | 422.8 | 496.5 |
| Fruit, dried | 67.7 | 48.4 | 87.6 | 83.4 | 131.7 | 169.6 | 158.3 | 135.8 |
| Fruits and berries processed | 104.9 | 99.8 | 112.2 | 125.3 | 136.1 | 185.8 | 185.2 | 246.0 |
| Nuts | 114.7 | 78.5 | 146.3 | 118.1 | 114.9 | 195.7 | 227.0 | 127.3 |
| Sugar, raw | 2,184.2 | 1,936.9 | 2,352.8 | 3,129.1 | 3,116.5 | 3,334.8 | 3,223.2 | 3,968.9 |
| Sugar, refined | 0.8 | 134.7 | 111.8 | 1.5 | 60.6 | 528.9 | 717.0 | 397.6 |
| Coffee, cocoa, tea | 505.7 | 455.6 | 615.2 | 615.0 | 739.2 | 745.8 | 575.7 | 496.9 |
| Spices | 22.4 | 27.5 | 31.2 | 35.9 | 38.0 | 33.8 | 38.6 | 38.1 |
| Beverages | 530.1 | 505.8 | 532.5 | 621.2 | 717.4 | 808.3 | 751.1 | 789.0 |
| Tobacco, raw | 226.2 | 212.0 | 233.8 | 224.1 | 246.5 | 293.4 | 324.2 | 383.2 |
| Tobacco products | 297.9 | 314.4 | 328.7 | 365.4 | 403.1 | 466.0 | 541.2 | 536.3 |
| Furs | 2.0 | 2.1 | 2.9 | 2.8 | 3.2 | 4.8 | 3.5 | 2.1 |
| Raw hides | 64.9 | 55.3 | 6.6 | 52.4 | 39.2 | 44.1 | 16.0 | 44.6 |
| Oilseeds | 129.3 | 454.3 | 390.3 | 270.8 | 542.2 | 368.6 | 587.8 | 456.7 |
| Oilseed meal ² | 9.3 | 0.4 | 7.4 | 2.3 | 17.1 | 143.7 | 323.7 | 446.5 |
| Natural fibers | 289.4 | 247.5 | 234.9 | 112.0 | 177.8 | 139.1 | 85.3 | 85.4 |
| Wool | 266.6 | 304.2 | 368.1 | 417.6 | 484.2 | 501.9 | 534.1 | 548.7 |
| Animal fats including butter | 12.1 | 10.5 | 67.9 | 47.0 | 216.5 | 412.8 | 514.2 | 346.6 |
| Vegetable oils | 54.8 | 58.3 | 83.1 | 83.5 | 146.4 | 259.7 | 413.4 | 441.0 |
| Technical fats and oils | 53.8 | 32.6 | 47.0 | 68.6 | 160.4 | 191.8 | 227.6 | 193.2 |
| Seed and planting materials | 86.3 | 105.1 | 193.1 | 128.6 | 120.8 | 180.3 | 194.7 | 175.1 |
| Total | 9,145.7 | 9,330.9 | 9,131.0 | 10,241.3 | 13,331.3 | 17,232.4 | 20,904.5 | 19,327.1 |

— = Negligible or none.

¹USSR official data converted at \$1.39 in 1975; \$1.33 in 1976; \$1.34 in 1977; \$1.46 in 1978; \$1.52 in 1979; \$1.54 in 1980; \$1.39 in 1981; \$1.38 in 1982. ²Estimate.

Table 11—Principal agricultural imports, USSR, 1975-82, by quantity

| Commodity | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| <i>1,000 metric tons</i> | | | | | | | | |
| Wheat ¹ | 9,146 | 6,686 | 6,348 | 8,951 | 9,532 | 14,926 | 17,823 | 21,011 |
| Barley ¹ | 1,001 | 2,244 | 43 | 482 | 1,362 | 930 | 300 | 2,617 |
| Corn ¹ | 5,548 | 11,376 | 4,013 | 13,221 | 12,272 | 10,049 | 16,307 | 11,462 |
| Other grain ¹ | 214 | 332 | 66 | 20 | 3,547 | 2,008 | 3,795 | 362 |
| Sorghum | 0 | 0 | 0 | 0 | 0 | 1,493 | 3,967 | 2,709 |
| Wheat flour ² | 471 | 528 | 642 | 543 | 1,100 | 1,332 | 2,178 | 1,260 |
| Rice, milled | 279 | 324 | 460 | 414 | 631 | 694 | 1,283 | 859 |
| Subtotal | 16,659 | 21,490 | 11,572 | 23,631 | 28,444 | 31,432 | 45,653 | 40,280 |
| Meat and meat products ³ | 515 | 362 | 617 | 184 | 611 | 821 | 980 | 939 |
| Shell eggs ⁴ | 767 | 654 | 691 | 680 | 767 | 737 | 556 | 526 |
| Vegetables, fresh | 144 | 186 | 191 | 182 | 147 | 133 | 213 | 174 |
| Vegetables, canned | 347 | 324 | 370 | 381 | 422 | 420 | 388 | 454 |
| Fruit, fresh | 860 | 871 | 841 | 847 | 907 | 995 | 1,021 | 1,158 |
| Fruit, dried | 118 | 101 | 113 | 114 | 109 | 130 | 124 | 126 |
| Sugar, raw | 3,236 | 3,343 | 4,287 | 3,990 | 3,766 | 3,839 | 4,190 | 6,161 |
| Sugar, refined | 4 | 383 | 458 | 3 | 294 | 1,056 | 963 | 1,115 |
| Coffee | 60 | 44 | 45 | 26 | 40 | 48 | 41 | 48 |
| Cocoa beans | 156 | 134 | 73 | 103 | 126 | 127 | 121 | 115 |
| Tea | 67 | 60 | 60 | 46 | 49 | 71 | 84 | 73 |
| Tobacco | 88 | 74 | 78 | 65 | 66 | 83 | 105 | 124 |
| Hides and skins ⁴ | 22 | 14 | 1 | 3 | 1 | 2 | 1 | 1 |
| Oilseeds | 424 | 1,827 | 1,455 | 966 | 1,814 | 1,155 | 1,459 | 1,582 |
| Oilseed meal ⁵ | 73 | 2 | 33 | 11 | 69 | 568 | 1,173 | 1,786 |
| Cotton lint | 137 | 116 | 94 | 65 | 86 | 49 | 22 | 26 |
| Wool, scoured | 110 | 110 | 112 | 127 | 134 | 124 | 126 | 125 |
| Vegetable oil, edible | 61 | 129 | 126 | 167 | 199 | 357 | 604 | 866 |

¹ERS estimates since 1976, official USSR sources report only value. ²Flour in wheat equivalent at 72 percent. ³Does not include live animals. ⁴Million pieces. ⁵Estimate.

Table 12—Major suppliers of selected agricultural goods to the USSR in 1982

| Commodity | Quantity | Supplier and Share |
|---------------------------------------|--------------------|---|
| | <i>1,000 tons</i> | <i>Percent</i> |
| Grain and grain products ¹ | 40,280 | United States(31), Canada(24), Argentina(22), Australia(5), Hungary(3), Pakistan(1), Belgium(1), and others(13) |
| Sugar ² | 6,783 | Cuba(57), France(6), Thailand(6), Brazil(5), West Germany(5), Philippines(3), Romania(1), and others(17) |
| Fresh meat | 593 | Argentina(13), Romania(11), New Zealand(10), France(7), Mongolia(7), and others(52) |
| Poultry | 260 | Hungary(49), Brazil(13), Bulgaria(5), Netherlands(2), Denmark(1), and others(30) |
| Hides and skins | 2 | Netherlands(33), Afghanistan(29), United States(26), Mongolia(11), and others(1) |
| Wool | 125 | Australia(43), New Zealand(22), Argentina(12), Mongolia(9), Uruguay(8), Afghanistan(4), and Syria(2) |
| Soybeans | 1,506 | United States(43), Argentina(39), Brazil(18) |
| Soybean meal | ³ 1,700 | Brazil(62), Netherlands(34), Belgium-Luxemburg(2), India(1), and others(1) |
| Fresh fruit | 1,158 | Hungary(18), Poland(11), Morocco(9), Greece(8), Egypt(7), Cuba(7), Bulgaria(6), Spain(6), and others(28) |
| Dried fruit | 126 | Afghanistan(36), Yugoslavia(16), Iran(13), Iraq(12), Romania(6), Turkey(4), Greece(3), and others(10) |
| Fresh vegetables | 174 | Bulgaria(39), India(24), Romania(10), Poland(6), Egypt(5), and others(16) |
| Cotton lint | 26 | Syria(70), Afghanistan(29), and others(1) |

¹Grain includes all major grains, rice, and flour in wheat equivalent at 72 percent. ²Total Soviet sugar imports in terms of refined value converted at 1.087. ³Estimate.

Table 13—USSR agricultural exports, 1975-82, by value

| Commodity | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|
| <i>Million dollars¹</i> | | | | | | | | |
| Wheat | 388.3 | 122.0 | 283.9 | 170.8 | 518.8 | 277.9 | 354.6 | 337.2 |
| Barley | 106.0 | 68.0 | 193.5 | 5.4 | 2.8 | 7.4 | 7.9 | 5.9 |
| Corn | 12.6 | 21.5 | 27.8 | 26.6 | 28.9 | 23.3 | 39.4 | 41.4 |
| Oats | 1.2 | 1.5 | 2.8 | 2.3 | 2.5 | 1.3 | 1.8 | 2.7 |
| Other grain | — | — | — | — | 2.5 | — | — | 5.9 |
| Flour-milling products & pulses | 173.9 | 186.1 | 172.4 | 185.7 | 233.0 | 227.8 | 291.3 | 160.9 |
| Subtotal | 682.0 | 399.1 | 680.4 | 390.8 | 788.5 | 537.7 | 695.0 | 554.0 |
| Meat and meat products | 50.9 | 49.5 | 38.5 | 51.5 | 43.8 | 49.5 | 98.2 | 48.0 |
| Milk and milk products | 34.6 | 36.0 | 36.4 | 40.2 | 47.5 | 48.1 | 52.6 | 43.3 |
| Vegetables, fruit & nuts | 31.6 | 24.9 | 29.5 | 28.5 | 31.7 | 47.2 | 46.2 | 43.2 |
| Sugar, refined | 24.9 | 25.3 | 23.9 | 48.4 | 66.8 | 71.1 | 95.3 | 97.2 |
| Confectionaries | 11.8 | 10.3 | 9.1 | 10.5 | 5.5 | 5.2 | 9.6 | 9.9 |
| Beverages | 51.2 | 54.0 | 57.5 | 72.4 | 84.6 | 93.4 | 85.9 | 87.3 |
| Tobacco products | 6.3 | 4.9 | 6.2 | 7.3 | 5.0 | 5.8 | 21.1 | 5.8 |
| Furs | 72.8 | 108.7 | 115.4 | 134.9 | 162.5 | 159.9 | 131.7 | 121.8 |
| Raw hides | 13.1 | 12.6 | 7.1 | 7.2 | 12.5 | 16.3 | 6.2 | 23.0 |
| Oilseed, tobacco and other raw materials | 78.1 | 54.5 | 67.3 | 62.3 | 65.3 | 71.5 | 62.3 | 67.9 |
| Natural fibers | 936.3 | 1,033.2 | 1,375.9 | 1,247.8 | 1,239.4 | 1,383.7 | 1,484.1 | 1,468.6 |
| Wool | 16.3 | 8.2 | 12.5 | 11.8 | 8.8 | 10.4 | 12.1 | 33.2 |
| Animal fats including butter | 73.1 | 57.5 | 74.8 | 83.5 | 84.4 | 80.9 | 58.5 | 59.0 |
| Vegetable oils | 310.7 | 172.0 | 141.0 | 98.8 | 90.6 | 87.0 | 74.0 | 67.0 |
| Technical fats and oils | 7.2 | 5.3 | 2.7 | 3.6 | 4.4 | 4.7 | 4.4 | 6.6 |
| Seeds and planting materials | 25.6 | 22.3 | 40.5 | 34.9 | 45.4 | 39.4 | 39.2 | 42.2 |
| Total | 2,426.3 | 2,078.2 | 2,718.6 | 2,334.3 | 2,786.7 | 2,711.8 | 2,976.4 | 2,778.0 |

— = Negligible or none.

¹USSR official data converted at \$1.39 in 1975; \$1.33 in 1976; \$1.34 in 1977; \$1.46 in 1978; \$1.52 in 1979; \$1.54 in 1980; \$1.39 in 1981; \$1.38 in 1982.**Table 14—Principal agricultural exports, USSR, 1975-82, by quantity**

| Commodity | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <i>1,000 metric tons</i> | | | | | | | | |
| Wheat ¹ | 2,665 | 808 | 2,062 | 1,150 | 3,071 | 1,439 | 1,899 | 1,807 |
| Rye ¹ | — | — | — | — | 16 | — | — | 36 |
| Barley ¹ | 818 | 503 | 1,506 | 50 | 26 | 49 | 53 | 40 |
| Corn ¹ | 86 | 149 | 177 | 158 | 163 | 153 | 267 | 346 |
| Oats ¹ | 9 | 9 | 18 | 16 | 16 | 12 | 13 | 16 |
| Flour ² | 790 | 878 | 904 | 1,068 | 1,057 | 835 | 796 | 338 |
| Groats | 124 | 157 | 109 | 123 | 222 | 118 | 175 | 229 |
| Pulses | 50 | 37 | 43 | 52 | 54 | 32 | 44 | 39 |
| Subtotal | 4,542 | 2,541 | 4,819 | 2,617 | 4,625 | 2,638 | 3,247 | 2,851 |
| Meat and meat products | 44 | 41 | 33 | 39 | 34 | 35 | 70 | 32 |
| Butter | 20 | 16 | 18 | 18 | 18 | 18 | 13 | 15 |
| Sugar, refined | 53 | 73 | 81 | 162 | 226 | 152 | 169 | 247 |
| Tea | 17 | 14 | 21 | 17 | 17 | 19 | 17 | 17 |
| Hides and skins ³ | 350 | 346 | 319 | 326 | 574 | 2,190 | 292 | 821 |
| Sunflowerseed | 61 | — | — | — | — | — | — | — |
| Cotton, lint | 800 | 878 | 972 | 858 | 789 | 843 | 916 | 949 |
| Flax tow | 20 | 15 | 17 | 16 | 15 | 14 | 4 | 8 |
| Vegetable oil, edible | 416 | 295 | 231 | 149 | 113 | 124 | 116 | 114 |
| Starch | 10 | 17 | 17 | 16 | 17 | 17 | 12 | 16 |

— = Negligible or none.

¹ERS estimates since 1976, official USSR sources report only value. ²Flour in wheat equivalent at 72 percent. ³Thousands.

Table 15—U.S. agricultural trade with the USSR, 1974-83

| Commodity | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|----------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <i>Million dollars</i> | | | | | | | | | | |
| Exports¹ | | | | | | | | | | |
| Wheat | 124.1 | 672.7 | 264.2 | 426.8 | 355.8 | 813.2 | 336.1 | 772.6 | 802.2 | 800.6 |
| Corn | 159.5 | 452.6 | 1,170.1 | 412.4 | 1,109.4 | 1,540.9 | 692.9 | 801.4 | 834.6 | 404.4 |
| Other grains | 16.6 | 5.2 | 10.1 | — | — | 31.1 | — | — | — | — |
| Rice | — | 9.2 | 15.3 | 25.2 | 6.0 | 9.1 | — | — | — | — |
| Soybeans | — | 2.9 | 126.4 | 154.4 | 222.1 | 494.1 | 45.3 | 8.4 | 171.2 | 159.5 |
| Peanuts | — | — | — | 4.5 | 16.6 | — | — | — | — | — |
| Oilcake & meal | .5 | — | — | 1.5 | .2 | 6.7 | — | — | — | — |
| Vegetable oil | — | — | — | — | — | 15.8 | — | — | 22.7 | — |
| Cattle hides | 7.9 | 5.2 | 2.5 | .8 | 8.1 | 3.2 | .1 | .1 | — | 10.6 |
| Fruit, nuts, & berries | 5.3 | 6.1 | 8.4 | 20.4 | 16.8 | 15.6 | 18.5 | 16.1 | 13.1 | 2.3 |
| Sugar | — | — | — | — | — | — | — | 15.6 | — | — |
| Cotton | — | — | — | — | — | — | — | — | — | 72.2 |
| Tallow, inedible | — | 14.0 | — | — | 18.7 | 57.6 | 28.2 | 48.5 | 17.9 | 21.5 |
| All other | 9.8 | 2.4 | 7.8 | 6.8 | 11.4 | 12.8 | 16.7 | 22.0 | 4.5 | 1.8 |
| Total | 323.7 | 1,170.3 | 1,604.8 | 1,052.8 | 1,765.1 | 3,000.1 | 1,137.8 | 1,684.7 | 1,866.2 | 1,472.9 |
| Imports | | | | | | | | | | |
| Casein & mixture | 2.0 | 1.7 | .7 | 1.7 | 2.4 | 3.0 | 1.0 | .3 | .8 | .6 |
| Furskins | 4.5 | 3.5 | 6.1 | 8.0 | 8.9 | 9.6 | 6.5 | 8.6 | 7.6 | 8.3 |
| Other animal products | .6 | .2 | .4 | .5 | .3 | .3 | — | .1 | 1.3 | .1 |
| Gelatin | .3 | — | .1 | — | — | — | — | — | — | — |
| Licorice root | .2 | 1.1 | .6 | — | — | — | — | — | — | — |
| Tobacco fillers | — | — | — | — | .6 | 1.2 | 1.5 | .9 | .4 | .3 |
| All other | .9 | .7 | .5 | .7 | .2 | .6 | .8 | 2.0 | .9 | 1.1 |
| Total | 8.5 | 7.2 | 8.4 | 10.9 | 12.4 | 14.7 | 9.8 | 11.9 | 11.0 | 10.4 |

— = Negligible or none.

¹Including transshipments through Canada, Belgium, the Netherlands, and West Germany.**Table 16—Tractors, grain combines, and trucks: Inventories, deliveries, and scrapping rates, USSR, 5-year averages and 1976-83 annual¹**

| Year | Tractors | | | Grain combines | | | Trucks | | |
|-----------------|------------------|------------------|--------------------------------|------------------|------------------|--------------------------------|------------------|------------------|--------------------------------|
| | Inven- tories | Deliv- eries | Scrapping rate ² | Inven- tories | Deliv- eries | Scrapping rate ² | Inven- tories | Deliv- eries | Scrapping rate ² |
| | Thousands | Percent | | Thousands | Percent | | Thousands | Percent | |
| 1966-70 average | 1,821 | 293 | 12.6 | 578 | 94 | 13.8 | 1,091 | 144 | — |
| 1971-75 average | 2,189 | 333 | 12.3 | 661 | 90 | 12.3 | 1,282 | 220 | 13.6 |
| 1976 | 2,400 | 369 | 13.0 | 685 | 98 | 13.7 | 1,442 | 269 | 16.0 |
| 1977 | 2,458 | 365 | 12.8 | 693 | 101 | 13.6 | 1,501 | 268 | 14.5 |
| 1978 | 2,515 | 371 | 12.8 | 700 | 111 | 15.0 | 1,528 | 270 | 16.2 |
| 1979 | 2,540 | 355 | 13.1 | 706 | 112 | 15.1 | 1,568 | 267 | 14.9 |
| 1980 | 2,562 | 347 | 12.8 | 722 | 117 | 14.3 | 1,596 | 268 | 15.3 |
| 1976-80 average | 2,495 | 361 | 12.9 | 701 | 108 | 14.3 | 1,527 | 268 | 15.4 |
| 1981 | 2,598 | 354 | 12.4 | 741 | 105 | 11.9 | 1,653 | 268 | 13.2 |
| 1982 | 2,649 | 350 | 11.5 | 771 | 110 | 10.8 | 1,699 | 268 | 13.4 |
| 1983 | NA | ³ 372 | NA | NA | ³ 116 | NA | NA | ⁴ 285 | NA |

— = Negligible or none.

NA = Not available.

¹Inventories are for the end of the year. ²Equal to deliveries minus change in inventories divided by inventories at the end of the preceding year.³Pravda, January 29, 1984. ⁴Ekonomika sel'skogo khozyaistva, no. 1 (1984), p. 4.

**Table 17—Production of mineral fertilizers by type, USSR,
5-year averages, and 1976-83 annual, and 1984 plan**

| Year | Total | Nitrogen | Phosphate | Ground phosphate rock | Potash | Trace elements |
|--------------------------------------|---------------------|---------------------|--------------------|-----------------------------|---------------------|-------------------|
| <i>1,000 metric tons¹</i> | | | | | | |
| 1966-70 average | 10,379 | 4,210 | 2,030 | 955 | 3,177 | 7 |
| 1971-75 average | 17,876 | 7,248 | 3,451 | 1,032 | 6,138 | 8 |
| 1976 | 22,590 | 8,609 | 4,833 | 831 | 8,310 | 7 |
| 1977 | 23,493 | 9,114 | 5,203 | 821 | 8,347 | 8 |
| 1978 | 23,653 | 9,299 | 5,347 | 806 | 8,193 | 8 |
| 1979 | 22,137 | 9,151 | 5,497 | 847 | 6,635 | 7 |
| 1980 | 24,767 | 10,241 | 5,622 | 833 | 8,064 | 7 |
| 1976-80 average | 23,328 | 9,283 | 5,300 | 828 | 7,910 | 7 |
| 1981 | 25,998 | 10,705 | 6,059 | 777 | 8,449 | 8 |
| 1982 | 26,738 | 11,593 | 6,283 | 774 | 8,079 | 9 |
| 1983 | 29,700 | ² 13,095 | ² 6,515 | ² 800 | 9,280 | ² 10 |
| 1984 plan | ³ 31,200 | ³ 13,400 | ³ 7,600 | ³ — | ³ 10,200 | ² 10 |

¹Nutrient weight basis. Nitrogen—20.5 percent N, phosphates—18.7 percent P₂O₅, ground rock phosphates—19 percent P₂O₅, potash—41.6 percent K₂O. ²ERS estimate. ³*Ekonomicheskaya gazeta*, no. 5 (1984), p. 2. Phosphate includes ground phosphate rock.

**Table 18—Deliveries of mineral fertilizers to agriculture by type, USSR,
5-year averages and 1976-83 annual**

| Year | Nitrogen | Phosphate | Ground phosphate rock | Potash | Trace elements | Total excluding feed additives | Feed additives | | Total including feed additives |
|--------------------------------------|---------------------|--------------------|-----------------------------|--------------------|-------------------|---|----------------|--------------------|---|
| <i>1,000 metric tons¹</i> | | | | | | | Urea | Feed phosphates | |
| 1966-70 average | 3,520 | ² 1,847 | 857 | 2,221 | 7 | NA | — | NA | 8,452 |
| 1971-75 average | 6,209 | 2,978 | 904 | 3,703 | 8 | 13,802 | 34 | 236 | 14,072 |
| 1976 | 7,252 | 4,068 | 835 | 5,577 | 7 | 17,739 | 78 | 438 | 18,255 |
| 1977 | 7,522 | 4,286 | 818 | 5,400 | 8 | 18,034 | 89 | 438 | 18,561 |
| 1978 | 7,658 | 4,551 | 809 | 5,394 | 8 | 18,420 | 79 | 342 | 18,841 |
| 1979 | 7,467 | 4,637 | 843 | 4,411 | 7 | 17,365 | 77 | 414 | 17,856 |
| 1980 | 8,262 | 4,760 | 830 | 4,904 | 7 | 18,763 | 86 | 432 | 19,281 |
| 1976-80 average | 7,632 | 4,460 | 827 | 5,137 | 7 | 18,064 | 82 | 413 | 18,559 |
| 1981 | 8,383 | 5,098 | 781 | 4,905 | 9 | 19,176 | NA | ³ 617 | 19,793 |
| 1982 | 9,038 | 5,344 | 771 | 4,991 | 8 | 20,152 | NA | ³ 610 | 20,762 |
| 1983 | ⁴ 10,246 | ⁵ 5,594 | ⁴ 900 | ⁴ 6,250 | ⁴ 10 | 23,000 | NA | ³ 675 | 23,675 |

— = Negligible or none.

NA = Not available.

¹Nutrient weight basis. Nitrogen—20.5 percent N, phosphates—18.7 percent P₂O₅, ground rock phosphates—19 percent P₂O₅, potash—41.6 percent K₂O. ²Includes feed additives. ³Total for feed additives. ⁴Estimate. ⁵*Ekonomicheskaya gazeta*, no. 5 (1984), p.2.



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